

Department of Economics, University of Bombay
Operations Research Group, Baroda

SURVEY
of
INDIA'S EXPORT POTENTIAL
of
OILCAKES

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SURVEY
OF
INDIA'S EXPORT POTENTIAL
OF
OILCAKES

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University of Bombay, Bombay
and
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Baroda

VOLUME IV

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C H A P T E R - VI

EXPORT PROSPECTS FOR OTHER

ANIMAL FEEDS

CHAPTER VI

EXPORT PROSPECTS FOR OTHER ANIMAL FEEDS

Apart from oilcakes, India has a large export potential in at least two other animal feeds, viz. de-oiled bran and mixed or compound feeds. While the de-oiled rice bran is used mainly as an ingredient in various animal feeds, the mixed feeds comprise of all prepared, complete feeds for animals.

A. De-oiled Rice Bran

Rice bran is a by-product of rice (paddy) and is the basic raw material for rice bran oil. "During the process of rice-milling, the layer round the endosperm is removed together with a portion of the polishing. This separated layer is called "rice bran". The quantity of rice bran obtained is variable as it depends upon the degree of polishing. Bran constitutes roughly between 6 to 10 percent of paddy rice. Bran is normally used as cattle feed. It contains albumin, vitamins and also oil to the extent of 15 to 20 percent."^{1/} This oil is edible and has less saturated fats as compared to groundnut oil, which is one of the very good edible oils. Linoleic acid -

^{1/} Industrial Development in Asia and the Far East - Vol. IV - Development of Key industries". Economic Commission for Asia and the Far East (1966) p. 282.

an essential polyunsaturated fatty acid - is higher in rice bran oil than in groundnut oil. Rice bran oil, therefore, is better than groundnut oil in nutritive value and is comparable to sesame oil.

The de-oiled rice bran is mainly used as an ingredient for mixed feed for poultry and pigs in more advanced countries like the U.K., Japan and the U.S.A. in addition to being used as cattle feed. The potential market for de-oiled rice bran is related to the production and use of molasses as feed for cattle. In Taiwan, the rice bran is used in mixed feed pelletizing, which converts it into a solid form to facilitate packing in paper bags and feeding to cattle. De-oiled rice bran has a potential market as an ingredient for blending with wheat flour as a special grade ~~for~~ families who are desirous of eating dark bread of lower cost but higher nutritive value. Extracted rice bran is used in Japan as a component in mixed fertiliser when it is in excess of demand for feeding stocks.

World Production of Rice Bran and De-oiled Bran

The production of rice bran is related to the production of paddy rice. Most of the world's rice is produced in the developing countries of Asia and the Far East. Rice milling techniques vary as between countries and, hence, the degree of polishing of rice also varies.

On an average, however, the rice bran recovery is 6 per cent of the paddy rice milled. Table 1 shows the estimated world production of rice bran for the two years 1966 and 1967. Even if 50 percent of the world rice bran production is available for extraction, this will yield, (on the basis of estimated production for 1967), 1.17 million tonnes of oil (with the assumption of extractable oil at 14 percent in the bran) and over 7 million tonnes of rice bran are extracted. The world production of rice bran oil may be around 100 tonnes while that of de-oiled rice bran is estimated at not more than 700,000 tonnes. Japan alone accounts for almost half of the world production of rice bran oil. The other important rice bran processing countries in the world are India, Taiwan, Burma and Thailand.

Rice Milling
Industry in
India 2/

India is one of the largest rice producing countries in the world. Its share in the world rice production is almost 20 percent. The rice milling industry in India, however, is almost "50 years behind the times". As the quality of rice bran essentially depends upon the rice milling system, it is necessary to review briefly the paddy rice processing industry in India.

2/ This section is partly based on James E. Wimberly's "What is rice mill modernization"? Economic Times, Bombay (January 11, 1969).

Table 1Estimated World Production of Rice Bran

Country	('000 tonnes)	
	1966	1967
India	2,742 (18.0)	3,600* (21.5)
Burma	396 (2.6)	480* (2.9)
Pakistan	984 (6.5)	1,080* (6.5)
Thailand	908 (6.0)	600* (3.6)
Japan	996 (6.6)	1,128 (6.7)
Other Countries	9,160	9,846
Total World Production	15,186	16,740

* Based on preliminary estimates of rice (paddy) output.

Notes: 1) Rice bran production estimated at 6 percent of paddy rice output.

2) Figures in brackets indicate percentages to the total World production.

Sources for Rice Paddy Production: F.A.O. Monthly Bulletin of Agricultural Economics and Statistics, Vol. 17, No. 3 (1968).

India has three rice processing systems. One is the traditional huller rice mill. The second is the under-run disc-sheller rice mill and the third is the modern fully-mechanised rice mill. There are around 43,000 huller units in operation. Each unit consists of one to three small huller machines and a husk-rice separator. Each huller is a small machine; and as paddy is fed into it, the abrasive force applied causes the husk and part of the bran to be removed from the rice kernel. The machine has a fine screen where the mixture of ground husk bran is discharged. At the end of the huller, a combination of rice, paddy, bran and husk is delivered. This combination is fed by hand into the second or even third huller till such degree of polishing as desired is obtained. The average commercial huller mill processes about 100 tonnes of paddy annually. The rice outturn is approximately 64 percent. The finished rice product has a mixed degree of polish, with some paddy, some foreign material, and husk. The bran yield is less and is often mixed with husk, sand and silica.

In the second type, there are some 2,000 "under run disc-sheller rice mills" and 3,000 sheller-huller combination units. Here, a paddy cleaner is used to separate foreign material before milling. A disc-sheller

is used to remove the husk. A paddy-rice separator is used to separate paddy from rice and cone polishers are used to remove the bran. The entire lot of the mills in this group can process about 12 million tonnes of paddy to yield nearly 8.2 million tonnes of rice (at an average recovery of 68 percent) and about 700,000 tonnes of rice bran. The quality of both rice and bran produced in such type of mills is better than that in pure huller type of mills. The husk as well as the sand-silica content in the bran is much less.

The third type of rice processing system in India began a few years ago with 7 proto-type modern rice mills. These mills include mechanical dryers, mechanical handling equipment, bulk storage, modern parboiling system and the most modern rice milling machinery. This machinery consists of very efficient paddy cleaners, rubber roll shellers, most efficient paddy separators, cone or abrasive polishers, bran separators, and grading equipment. In these mills, rice out-turn averages 71 percent with a big improvement in quality of both rice and bran.

With the huller-type rice milling units predominating in India, the quality of rice bran produced is generally low, since the sand-silica and fibre content is relatively high. Such low quality bran is unsuitable for extraction,

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as it yields, in turn, low quality de-oiled rice bran. Theoretically, the bran output of 5,000 rice mills having sheller equipments, is of a quality than can be used for extraction. However, local demand being high mainly for cattle feed, many millers are known to adulterate the bran with powdered husk, etc., and, as a result, very much less good quality bran is available for the solvent extraction process.

Another problem emerging directly from the quality of rice bran relates to the rice bran oil. The crude rice bran oil extracted in solvent plants has very high free fatty acid content (FFA) varying from 8 to 40 percent or even more. This is so because free fatty acids rapidly develop in rice bran after rice milling. "Immediately, after, milling, the free fatty acids in the oil contained in the bran are below 3 percent but they increase at a rate which may be as high as one percent per hour during the first four hours and at a slower rate thereafter when stored under humid conditions and at atmospheric temperatures of 25 - 31°C. Rapid hydrolysis of the oil is started by the enzyme present in the bran^{3/} The moisture content of rice bran usually varies between

^{3/} Industrial Development in Asia and the Far East", op.cit. p.282.

8.5 to 12.5 percent and increases with the length of storage. Consequently, the FFA content in rice bran oil is usually very high. The refining process is expensive, while the high refining loss of nearly 30 percent or even more renders refining uneconomical. With the result, the rice bran oil is virtually unsuitable for edible purposes and is used entirely for such industrial purposes as soap making.

In the long run, the development of fully-mechanised rice milling plants with modernised equipments for drying, storage, handling and milling would pave way for augmenting the supply of quality rice bran. It is estimated that an investment of nearly Rs.25/- lakhs would be necessary for setting up a modern rice mill of 4 tonne per hour capacity. The economics of modern rice mill system, however, falls outside the pale of the present study, as it is more concerned with rice which is the main product of a rice mill than bran which is an incidental minor by-product.

In the short run, however, the Government should encourage small units to install ancillary equipments to improve both the rice yield and its quality, and to reduce the sand-silica-fibre content in the bran. The following equipments would generally be required to modernise the existing rice mills.

- a) A separator for huller type mills,
- b) precleaner and rubber roll sheller in those rice mills where hullers are used for polishing only.
- and c) precleaner, rubber roll sheller and cyclone dust collectors for sheller type mills of small size and in addition, screw conveyors, bran sifters and triend cylinders for large-size units.

The cost for modernisation of sheller type rice mill of one tonne rice per hour capacity would be less than Rs. 50,000^{4/}. The cost would be considerably less for still smaller units. Nevertheless, as there are nearly 50,000 rice mills in the country, the cost involved in modernisation of all mills, would be very large. At the same time, since the existing rice milling capacity in the country is at present not utilised to the extent of more than 50 percent (even on the basis of 8-hour a day) it seems that even if 20 percent of the units in each of the important rice producing regions are modernised during the next 7-8 years, it would yield considerable returns in terms of quality rice and bran output.

As regards the FFA problem, it is desirable to extract fresh rice bran as soon as it is separated in the rice mill. This is, however, rather difficult unless the

^{4/} See K.N. Koshal, "Dandekar machines for modernisation", The Economic Times, January 11, 1969.

rice mill and the solvent extraction unit are vertically integrated. Hence, in order to check the enzyme action, rice mills should be encouraged to stabilise bran immediately after their production. Experiments have shown that after heating at 105°C . for three hours, free fatty acids do not increase to more than 7.2 percent even after 50 days.^{5/}

At the collection centre near the rice mill area, the following three steps are required to be carried out in order to get good stabilised rice bran for oil extraction.

(i) The broken rice and germ amount to 1.5 percent of the bran. These should be separated by screening the crude rice bran. Rice germ is noted for its vitamin E content. Broken rice and rice germs are valuable poultry feeds;

(ii) The lipase activity in undried crude rice bran is to be inhibited by heating and drying in steams jacketed screw conveyors. The bran is to be heated rapidly to 105°C .

(iii) The dried bran is to be pelletized to reduce volume and nuisance of dust in packing. Bran is air cooled

^{5/} Journal of the Oil Technologists Association of India, Vol. 18, Part II (1963), p. 144.

before packing. The pellets can be packed in kraft paper bags, preferably with moisture-proof polyethylene lining.^{6/}

We understand that the necessary equipment for stabilisation of rice bran is not expensive. The Government may, therefore, require the installation of such stabilisation equipment by rice millers, especially in the Punjab and Andhra Pradesh where a large number of rice bran processing units are concentrated. The necessary financial assistance and technical guidance for that purpose may be made available to the rice mills. As the resultant rice bran would fetch much higher price than the low quality bran produced now, the rice mills could easily recover their investments within a few years.

The Rice-bran
Extraction
Industry

The rice bran extraction industry is of very recent origin. The possibility of extracting oil from rice bran was first explored by the Central Food Technological Research Institute, Mysore which had also set up a pilot plant for the purpose. The Institute had developed an extraction process using alcohol as solvent. The first unit - Messrs Ulhas Oil and Chemical (Industries) Ltd., - to take up rice bran extraction on a commercial basis was set up in Bombay in 1960-61. At present, there are

^{6/} Industrial Development in Asia and the Far East",
op.cit. p. 283.

24 solvent extraction units all over the country processing rice bran. Not all of these units, however, confine their processing operations to rice bran only. Some of the units process oilcakes and other oil bearing material as well. Appendix 1 gives the names of the 24 solvent extraction units processing rice bran together with their installed capacity and location. Total installed capacity of these 24 units is 995 tonnes per day. Rice bran extraction plants generally operate for 8 months (240 days) in the year. On this basis, the installed capacity for the industry as a whole works out to approximately 2.4 lakh tonnes per annum. Since the output of the industry as a whole is estimated at around 80,000 tonnes of extracted rice bran, capacity utilisation can be placed at about 42 percent only. The capacity of the units ranges from 5,000 tonnes to 16,000 tonnes per annum.

Almost all the rice bran extraction units are members of the All-India Solvent Extractors Association. Twelve units, however, have formed the Rice Bran Export House. The Export House undertakes to export rice bran extractions on behalf of its members. Installed capacity of these 12 units accounts for 62 percent of the total installed capacity in the industry. This Export House also accounts for the bulk (above 75 percent) of the de-oiled rice bran exports from India.

Estimated production of rice bran oil and de-oiled rice bran in India since 1961 is shown in Table 2.

Table 2

Estimated Production of Rice-bran Oil and
De-oiled Rice Bran

Year	('000 tonnes)	
	Rice-Bran Oil	De-oiled Rice Bran
1961	1.7	9.0
1962	2.1	11.0
1963	2.5	13.3
1964	7.5	39.8
1965	11.3	60.0
1966	13.0	70.0
1967	15.0	80.0

In 1967, India produced about 60 million tonnes of paddy rice. Thus, against a potential production of 5.0 lakh tonnes of rice bran oil and slightly over 3.0 million tonnes of de-oiled bran, India produced a mere 15,000 tonnes of rice bran oil and 80,000 tonnes of de-oiled rice bran. It should be admitted, however, that the industry is growing rapidly and the production of rice bran oil and de-oiled rice bran is steadily increasing

from year to year. Nevertheless, in view of the large unutilized potential, it is essential to discourage the present practice of bran being used directly as an animal feed so that it could be used more efficiently for oil. But meanwhile, steps need to be taken to continue providing adequate animal feed nutrients through the supply of de-oiled rice bran.

Processing Cost

The chief input cost is that of the price of rice bran which fluctuates from time to time depending on the rice crop on the one hand and demand for quality bran on the other. Rice bran prices ruled at Rs.510 per tonne in early 1967. Thereafter, they have moved downward to Rs.340 per tonne in October 1968. Processing costs for rice bran are generally higher than those for oilcake extraction. The breakdown of the processing costs with plant capacity of 15,000 tonnes per annum (of 240 working days) involving capital investment of Rs.20 lakhs and working capital of Rs.15 lakhs are given in Table 3.

Costs of processing are generally stable, except for small variations in administration and interest costs which vary as between plants with different size capacities. Most of the units are located near rice milling plants because of the need for quick processing to avoid

extensive enzyme activity in the bran as well as to maximise the extraction of oil.

Table 3

Details of Processing Costs per Metric Ton of
Rice Bran

	Cost in Rupees per tonne
1. Depreciation	13/-
2. Interest on Working Capital	10/-
3. (a) Labour Handling Costs	7/-
(b) Plant Labour Cost	4/-
4. Administration	4/-
5. Solvent	13/-
6. Fuel Oil	12/-
7. Power	3/-
8. Laboratory	1/-
9. Repairs & Maintenance	6/-
10. Insurance	3/-
11. Miscellaneous Expenses	4/-
Total	80/-

Source: Rice Bran Export House.

De-oiled rice bran has limited domestic demand, estimated to be around 25 percent of the output at present. The demand originates mainly from the large compound feed producers such as the Hindustan Levers. Prices of de-oiled rice bran in the international markets are determined both by supply of and demand for the product itself and the relative prices of the large number of substitute products. Table 4 shows the processing margins in the rice bran oil extracting industry over the last two years on a monthly basis.

Table 4 clearly indicates that the rice bran extraction industry is faced with adverse processing margins. Prices of rice bran oil fluctuate widely depending on the supply-demand situation for industrial oils as a whole. Over the period March 1967 to October 1968, prices of rice bran have generally trended downward. The price decline in the case of rice bran extractions, it will be observed, is generally more than that in the case of rice bran. This combined with the erratic performance of rice bran oil price has resulted in the industry being faced with adverse processing margins. However, it must be cautioned that the magnitude of adverse margins as shown in column 12 of Table 4 appear to be the inflated one. As in the case of the oilcake extraction

Table 4

PROCESSING MARGINS IN THE RICE-BRAN EXTRACTION INDUSTRY
(MARCH 1967 TO OCTOBER 1968)

		1 9 6 7				
		March Rs.	April Rs.	May Rs.	June Rs.	July Rs.
<u>COST:</u>						
1.	Ex-factory price of Rice bran including bagging per M. ton	510	510	473	428	362
2.	Processing cost per M. ton	80	80	80	80	80
3.	Total cost (1+2)	590	590	553	508	442
<u>REALISATIONS:</u>						
4.	Ex-factory price of Rice Bran Oil per M. ton	3258	2962	2760	2559	2170
5.	Oil price in (4) x 0.14 tons oil Recovery*	456	415	386	358	304
6.	G.I.F. price of rice bran extractions per L. ton including bagging (in £) £ 17-7-6 17-15-6 17-13-9 17-15-0 17-8-9					
7.	Rupee equivalent of (6) per M. ton	365	373	371	372	376
8.	Expenses for forwarding from factory to doctks and shipping to U.K. per M. ton (Table 6)	185	185	185	185	185
9.	Ex-factory price of Rice bran extractions per M. ton (7-8)	180	188	186	187	191
10.	R.B. Extractions price (9) x 0.84 tons extractions recovery*	151	158	156	157	160
11.	Total Realisations (5+10)	607	573	542	515	464
12.	Difference between 3 and 11	+17	-17	-11	+7	+22

Note: Rupee equivalent for March 1967 to November 1967 @ L 1 = Rs.21, from December 1967 onwards £ = Rs.18/-.

* Oil recovery rate at 14 percent, de-oiled rice bran 84 percent waste material.

Table 6 gives a breakdown of ex-factory (India) to U.K. port cost. The term R.B. denotes Rice Bran;

Source: Rice Bran Export House, Bombay.

TABLE 4 (Contd.)

	1 9 6 7				
	August Rs.	September Rs.	October Rs.	November Rs.	December Rs.
<u>COST:</u>					
1. Ex-factory price of Rice bran including bagging per M.ton	333	358	358	383	373
2. Processing cost per M.ton	80	80	80	80	80
3. Total cost (1+2)	413	438	438	463	453
<u>REALISATIONS:</u>					
4. Ex-factory price of Rice Bran Oil per M.ton	1888	1988	1869	1825	2030
5. Oil price in (4) x 0.14 tons oil Recovery*	264	278	262	255	284
6. C.I.F. price of rice bran extractions per L.ton including bagging (in £)	£ 18-0-0	17-19-6	17-12-0	17-15-0	21-0-0
7. Rupee equivalent of (6) per M.ton	378	373	369	372	378
8. Expenses for forwarding from factory to docks and shipping to U.K. per M.ton (Table 6)	185	185	185	185	205
9. Ex-factory price of Rice Bran extractions per M.ton (7-8)	193	192	184	187	145
10. R.B. Extractions price (9) x 0.84 tons extractions recovery*	162	161	155	157	145
11. Total Realisations (5+10)	426	439	417	412	429
12. Difference between 3 and 11	+13	+ 1	-21	-51	-24

TABLE 4 (Contd.)

	1 9 6 8				
	January	February	March	April	May
	Rs.	Rs.	Rs.	Rs.	Rs.
<u>COST:</u>					
1. Ex-factory price of Rice bran including bagging per M.ton	374	363	390	350	340
2. Processing cost per M.ton	80	80	80	80	80
3. Total cost (1+2)	454	443	470	430	420
<u>REALISATIONS:</u>					
4. Ex-factory price of Rice bran oil per M.ton	1972	1825	1850	1760	1735
5. Oil price in (4) x 0.14 tons oil Recovery*	276	255	269	246	243
6. C.I.F. price of rice bran extractions per L.ton including bagging (in £)	£ 21-8-9	21-0-0	19-15-0	19-15-0	19-15-0
7. Rupee equivalent of (6) per M.ton	386	378	355	355	355
8. Expenses for forwarding from factory to docks and shipping to U.K. per M.ton (Table 6)	205	205	205	205	205
9. Ex-factory price of Rice Bran extractions per M.ton (7-8)	181	173	150	150	150
10. R.B. Extractions price (9) x 0.84 tons extractions recovery*	152	145	126	126	126
11. Total Realisations (5+10)	428	400	395	372	369
12. Difference between 3 and 11	-26	-43	-75	-58	-51

TABLE 4 (Contd.)

	1 9 6 8				
	June Rs.	July Rs.	August Rs.	September Rs.	October Rs.
<u>COST:</u>					
1. Ex-factory price of Rice bran including bagging per M.ton	320	320	315	310	340
2. Processing cost per M.ton	80	80	80	80	80
3. Total cost (1+2)	400	400	395	390	420
<u>REALISATIONS:</u>					
4. Ex-factory price of Rice bran oil per M.ton	1620	1700	1900	1950	1990
5. Oil price in (4) x 0.14 tons oil Recovery*	227	238	266	273	279
6. C.I.F. price of rice bran extractions per L.ton including bagging (in £)	£ 19-10-0	17-15-0	18-0-0	17-15-0	17-10-0
7. Rupee equivalent of (6) per M.ton	350	320	325	320	315
8. Expenses for forwarding from factory to docks and shipping to U.K. per M.ton (Table 6)	205	205	205	205	205
9. Ex-factory price of Rice Bran extractions per M.ton (7-8)	145	115	120	115	110
10. R.B.extractions price (9) x 0.84 tons extractions recovery*	122	97	101	97	92
11. Total Realisations (5+10)	349	335	367	370	371
12. Difference between 3 and 11	-51	-65	-28	-20	-49

industry, processors have to use their judgements in purchase and sales policies to ensure themselves against losses. Again, though the processing costs of rice-bran are generally higher than in the case of oilcakes, the figure of Rs.80 per tonne estimated by the Rice Bran Export House seems somewhat inflated. According to the ECAFE study^{1/} referred to earlier, the direct (excluding overheads) rice bran extraction charges in July 1965 worked out to be about Rs.18/- per tonne, while the indirect expenses have been estimated at Rs.550,000 per annum for a plant with a capacity of 15,000 tonnes. The indirect expenses thus work out to Rs.36.66 per tonne of rice bran and the total processing cost amounts to about Rs.55.00 per tonne. The forwarding expenses in export trade (Table 6) likewise appear to be exaggerated (see discussion below). But these facts notwithstanding, there is no gain saying that the profitability of the rice bran extraction industry is very low, if not negative.

Exports

The average Indian exports has been 55,000 tonnes of de-oiled rice bran. Exports of rice bran extractions for the last three years, destination-wise, are shown in Table 5.

^{1/} Industrial Development in Asia and the Far East, op.cit. pp.285-286.

Table 5Exports of De-oiled Rice Bran from India

Country	(Quantity in tonnes)		(Value in '000 rupees)			
	1965-66		1966-67		1967-68	
	Quantity	Value	Quantity	Value	Quantity	Value
Japan	1,544	284	2,663	670	102	29
Malayasia	1,103	201	371	117	100	30
Germany	109	84	-	-	-	-
U.K.	58,554	11,275	52,726	13,053	51,673	11,925
Singapore	-	-	245	67	1,010	247
Others	-	-	505	122	585	132
Total	61,400	11,844	56,510	14,029	53,470	12,363

Source: Monthly Statistics of the Foreign Trade of India, D.C.I.S

Foreign exchange earnings from this commodity in 1967-68 has been Rs.1.2 crores. United Kingdom is by far the largest market for Indian rice-bran extractions. The exports to this country-represented over 90 percent of India's total exports of de-oiled rice bran. Almost the entire exports of Indian de-oiled rice-bran are transacted through a single broker firm. Japan, Malayasia, Germany and Singapore, each absorb very small quantities of de-oiled rice bran from India. Exports to these countries, it will be observed from the table above fluctuate from year to year.

The main problems in the export trade of de-oiled rice bran are (1) high freight costs, (2) import duties and agricultural cess levied in some of the West European countries, and (3) low quality of Indian rice bran.

Rice bran, being a low-valued bulk product, the freight costs play an important role in the economics of rice bran export trade. Table 6 below gives the costs incurred by the exporter from the ex-factory stage to the c.i.f. U.K. port stage. Quality allowance and weight shortage (items 9 and 10) are not necessarily incurred depending upon the extent to which contractual obligations are adhered to. To this extent, forwarding expenses are inflated, say, by Rs. 10-15 per tonne. The gunny bags used for packaging are generally sound second-hand bags. It will be observed from Table 6 that freight costs are of an overwhelming importance. As compared to groundnut extractions, freight costs on rice bran extractions form a relatively much higher proportion of the f.o.b. price. The c.i.f. import (U.K.) price ports of rice bran extractions has been, on an average, £ 17 per ton, the freight charges alone are £ 7-10 sh. In other words, freight costs account for almost 70 percent of f.o.b. price as against 20 percent in the case of groundnut

Table 6

Details of Expenses for Forwarding Rice Bran Extractions
From Factory to Docks and Shipping to U.K. per Metric Ton

	Cost per M. Ton in Rs.	
1. <u>Ocean Freight</u>		
a) Freight Charges	Sh. 127/6	
b) 12 $\frac{1}{2}$ % Devaluation Surcharge	Sh. 16/-	
c) Suez Surcharge	Sh. 21/-	
Total	Sh. 164/6	
Less 10% rebate on freight and devaluation surcharge	Sh. 15/-	
Net Freight Costs	Sh. 149/6	135/-*
2. Fumigation		4/-
3. Transport, loading, un-loading and post charges		18/-
4. Bagging		10/-
5. Insurance		1/-
6. Commission		4/-
7. Superintendence Charges		2/-
8. Conversion from Long ton to Metric tonne		6/-
9. Quality Allowance at 4% on average c.i.f. rate of Rs. 275/- per ton		15/-
10. Weight shortage at 2 $\frac{1}{2}$ % on average C.I.F. rate of Rs. 276/- per ton		10/-
		205/-

- * Note: 1) The expenses of freight of Sh. 149/6 per M. ton i.e. Rs. 135/- at conversion rate of Rs. 18/- per £ are as from December 1967, i.e. after devaluation of sterling as the entire Suez Surcharge as well as Devaluation Surcharge are being borne by the sellers. The expenses thus come to Rs. 205/- per ton.
- 2) Prior to December 1967, i.e. prior to Devaluation of sterling, the expenses of freight came to Sh. 127/6 i.e. Rs. 114/- at conversion rate of Rs. 21/- per £ as the entire Suez Surcharge of Rs. 20/- was borne by the U.K. buyers. The total expenses prior to December 1967 are therefore Rs. 185/- per ton.

Source: Rice Bran Export House, Bombay.

extractions. The same applied in the case of the Continental ports. We are given to understand that, though some U.S. importers are interested in Indian rice bran extractions, freight renders such business prohibitive. Since most exports are in small lots, it is impossible for any single exporter to undertake charters. The entire exports of de-oiled rice bran are by the Conference lines.

Trade Res-
trictions

Indian exports of de-oiled rice bran are almost entirely concentrated in the U.K. market where the commodity does not have to bear an import duty or quota restriction. It is generally understood that rice bran for mixing with other feed material in compound feed-stuffs is not widespread in most advanced countries of Europe. Most West European countries restrict the imports of de-oiled rice bran by way of an import duty of 7.6 percent ad-valorem. Though the duty by itself, is not high, an additional levy on agricultural products based on the starch content is indeed almost as prohibitive as the freight cost. The agricultural cess on the basis of starch content in these countries is reported to be at the following rates.

the Indian de-oiled rice bran, import levies in especially the West European countries, and high incidence of freight cost.

We have already examined earlier the quality problem which originates at the rice-milling stage and have suggested appropriate technical measures necessary to bring about an improvement in the quality of rice bran produced. It may be emphasised that, though the U.K. buyers have not been insisting on any fibre guaranteed permit sand and silica content even upto 8 percent, the importers in other countries, especially, in Western Europe are more quality-conscious because the regulations governing mixed feed sales in many of these countries are rather stringent.

As regards the import levies, we suggest that the Government of India should urge the West European countries to remove such levies and treat de-oiled rice bran like all other animal feed-stuffs, such as, for example, oilcakes. The reported agricultural cess on de-oiled rice bran, fixed pro-rata on the basis of its starch content, by some of the West European countries is clearly unjustified, since rice bran extractions are used for animal feeds and not for the manufacture of starch products.

The freight problem is more serious in rice bran extractions than even in oilcakes. Rice bran, being a very low-valued bulk product,^{8/} the freight cost plays an important role in the rice bran export trade. At present, the Conference freight rate for deoiled rice bran is £ 7-9 sh. 6 d. per ton for the U.K./West European base ports. The freight cost thus accounts for 40 percent of the c.i.f. price, and adds almost 70 percent to the F.O.B. value of the de-oiled rice bran when it is exported. If the freight cost has not adversely affected our exports to the U.K., it is mainly because the domestic price of raw rice bran has declined considerably since early 1967. Nevertheless, if the exports of this commodity are to be increased in future, we suggest that the Karmahon Conference may be prevailed upon to reduce the freight rate by at least 40 shillings per ton so as to make this commodity more competitive in the West European markets including the U.K.

The utility of de-oiled rice bran as an animal feed additive is not yet known to many compound feed manufacturers, in East and West European markets. This would have to be suitably demonstrated to the feed manufacturers in these countries to make the commodity acceptable to them. We would suggest that the Export

^{8/} De-oiled rice bran is currently (i.e. in January 1969) quoted in the U.K. market at prices varying from £ 17 to £ 19 per long ton depending upon the quality and shipment periods, while groundnut extractions are quoted around £ 42 per long ton.

exports of de-oiled rice bran may be anticipated to increase to 75,000 tonnes in the first year of such scheme, 100,000 tonnes in the second year and 125,000 tonnes in the third year. The total gains to the economy would, of course, be much larger in view of the increased oil recovery and the development of the indust

APPENDIX 1INSTALLED CAPACITY: SOLVENT EXTRACTION PLANTS PROCESSING RICE BRAN
EXTRACTION

Name*	Location	Approx. capacity tons per day
1. Omrao Industrial Corpn. Pvt. Ltd.	Kanpur, U.P.	65
2. Motilal Hariprasad & Bros.	Guntur, A.P.	65
3. Dulichand Omraolall	Calcutta	65
4. Foods Fats & Fertilisers Ltd.	Tadapalligudem, A.P.	50
5. East Coast Oil Corpn.	"	25
6. Khandesh Extractions	Chalisgaon, M. .	60
7. Seth Oil Mills Pvt. Ltd.	Raipur, M.P.	65
8. Seth Oil Mills Pvt. Ltd.	Amritsar, Punjab	40
9. Seemas Oil Mills Pvt. Ltd.	Bilaspur, M.P.	50
10. New India Oil Mills	Bombay	50
11. United Oil Mills	New Delhi	50
12. Andhra Oils & Fertilisers Co.	Vijayawada, A.P.	<u>25</u> 610
13. Dandelkhand Solvent Extraction and Rice Mills Pvt. Ltd.	U.P.	25
14. Lal Oil & Chemical Mills	Punjab	25
15. Oils & Allied Products Pvt. Ltd..	Delhi	40
16. A Plant	Karbal Haryana	40

* Units No. 1-12 are members of the Rice Bran Export House, Bombay.

Contd.....

APPENDIX 1 (Contd.)

Name	Location	Approx. capacity tons per day
17. Prag Ice & Oil Mills	Aligarah, U.P.	25
18. Suboraya	Kakinada	40
19. New Diwan Oil Mills	Punjab	25
20. K.N. Industry	Bilaspur, M.P.	40
21. International Exports & Estate Agencies	Vijayawada, A.P.	40
22. A Plant	Kaluru, A.P.	25
23. Venkateshwara Chemical Industries	Masulipattam, A.P.	40
24. A Plant	Nellore, A.P.	20
		995

APPENDIX-2

PURCHASE CONTRACT OF BOILED RICE BRAN

CONTRACT NO.

DATED:

Messrs.....

.....

.....

Dear Sirs,

1. We, (hereinafter called the Buyers) confirm having purchased from Messrs.
..... (hereinafter called the Sellers) through the undermentioned goods on the terms & conditions mentioned below:

2. QUALITY: Boiled Rice Bran, fresh, free from admixture, warranted to contain not less than 19% Oil and not more than 8% Sand and/or Silica.

3. QUANTITY: M.Tons bags of Kgs. gross/nett.

4. PRICE: Rs. per M.ton (including taxes and/or duties) gross weight/nett weight, delivered at Buyers Factory Godown at/Sellers godown at/F.O.R. /including siding charges wherever applicable.

5. DELIVERY:
 - (a) Despatch duringto
 - (b) R.R to be tendered by the Sellers or before to the Buyers at their Office at
.....
 - (c) Delivery before
..... R.R. shall be tendered before 2.30 p.m. on work week days and before 1.00 p.m. on Saturdays. The responsibility for murrage upto 1.00 p.m. of the next working day of the Railway follow the date on which the R.R. is tendered shall be on Sellers Account. If R.R. are tendered or presented after the above timings, they shall be deemed to have been delivered on the next working day of the Railway.
6. PACKING: Uniform, in new single gunny bags/second hand gunny bags to be supplied to the Buyers/Sellers at their cost.
7. PAYMENT: 60%/80% at Buyers option, against Rail Receipt or delivery of the goods and balance on finalisation of weight and analysis.
8. QUALITY ALLOWANCE: Should be the whole, or any portion which may turn out equal to warranty as stated in Clause 2 above, the goods must be accepted at an allowance to the Buyers at the following rates:
 - (a) For any deficiency in percentage of Oil below 19% the Sellers will pay an allowance of Rs. per ton (price of Oil per ton divided by guaranteed minimum Oil percentage basis) per each percentage deficiency in Oil and proportionately any fraction thereof. Buyers will reject the goods if the Oil content is below

- (b) For any excess of Sand and/or silica over 8% the Sellers will pay an allowance of 2% of the contract price for each percent of excess and proportionately for any fraction thereof. The Buyers will have the right to reject the goods if the Sand and/or Silica content is in excess of 12% or accept it with 3% allowance for each unit of Sand and/or Silica in excess of 12% and proportionately for any fraction thereof.

9. QUALITY
PREMIUMS:

- (a) For any excess of Oil content over 19%, the Buyers will pay a premium of Rs..... (price of Bran per ton divided by 38 i.e. twice the guaranteed minimum Oil percentage basis) for each percent of excess Oil and proportionately for any fraction thereof.
- (b) For Sand and/or Silica content below 8% the Buyers will pay a premium of 3% of the contract price for each percent of Sand and/or Silica content less than the maximum guaranteed percentage of 8% and proportionately for any fraction thereof.

10. SAMPLING
&
ANALYSIS:

For the purpose of drawing samples the Sellers shall, within 48 hours of receipt of the written or telephonic intimation of the Buyers informing arrival of goods at the Factory, depute their representative to the Factory of the Buyers. Four samples will be drawn jointly at the Buyers/Sellers Factory or Godown or at the place of delivery by the representatives of the Buyers and the Sellers from each wagon load/lot/lorry and sealed, the each one of them shall be numbered in case the Sellers representative is not present as provided hereinabove the samples will be drawn by the Buyers representative and sealed, these sealed samples will be binding on both parties for analysis reports as provided below, One sealed sample will be taken by

Buyers for analysis; Sellers shall arrange to collect the second sample and the other two will be retained by the Buyers. The Buyers will report to the Sellers in writing within 20 days after sealing of the samples the result of the first analysis. In case the Sellers so desire, they may send the second sealed sample to any one of the following laboratories.

- | | |
|-----------|--|
| BOMBAY | <ul style="list-style-type: none"> 1) Messrs. Therapeutics Chemical Research Corporation, Bombay-3. 2) Messrs. J. Parikh & Co., Bombay-9. 3) Messrs. Italab (Pvt.) Ltd., Bombay- 1. |
| MADRAS: | <ul style="list-style-type: none"> 1) Messrs. Therapeutics Chemical Research Corporation, Madras. 2) Messrs. Madras Oil Seeds Association, Madras. 3) Messrs. Italab (Pvt.) Ltd., Madras. 4) Messrs. Superintendence Co. of India. |
| CALCUTTA: | <ul style="list-style-type: none"> 1) Messrs. R. V. Briggs Ltd., Calcutta. 2) Messrs. Italab (Pvt.) Ltd., Calcutta. 3) Messrs. Superintendence Co. of India. |
| VIZAG: | <ul style="list-style-type: none"> 1) Messrs. Therapeutics Chemical Research Corporation. 2) Messrs. Superintendence Co. of India. 3) Messrs. Italab (Pvt.) Ltd. |

Under intimation to the Buyers in writing within 7 days of receipt of Buyers Report. On receipt of the second analysis result, which shall be communicated to the Buyers within 5 days, the Buyers may accept the same or forward the third sealed sample for third analysis only if the difference on any item between the first and second

analysis is more than $1/2\%$ Such Third analysis will be called for only for that particular item of test which is in dispute in previous two analysis. Sellers will also have similar right to opt for third analysis for which Buyers will forward their sample, if difference between first and second analysis is more than $1/2\%$ and Sellers to inform Buyers of their desire to exercise such option at the time of sending analysis report of the second sealed sample to the Buyers. In case third analysis is undertaken the mean of the nearest two analysis of the three shall be taken as final and binding on both parties. The cost of first analysis shall be borne by the Buyers. The cost of second analysis shall be borne by the Buyers, if the Result of the second analysis report exceeds by more than 1% of the first analysis report, taking the first analysis result as basis; and the cost of third analysis shall be borne by the party against whom the third analysis is reported, taking the mean of the first and second analysis as basis.

11. WEIGHMENT:

For the purpose of weighment the Sellers shall within 48 hours of receipt of the written or telephonic intimation of the Buyers informing arrival of goods at the Factory, depute their representative to the Factory to Buyers. Weighment of goods will be made at Buyers/Sellers Factory or Godown or at the place of delivery in presence of Buyers/Sellers representative if present, at the time of weighment. Ten percent of the total number of bags selected at random from each lot shall be weighed and the weight of the whole lot determined on the basis of such ten percent weighment. If, however, the Buyers find that the weights of the different bags vary by more than two percent from the approximate uniform weight, full weighment may be made

for which extra cost shall be borne by the Sellers. In case Sellers desire to have full weighment made, it shall be made for which cost shall be on their account. If Sellers representative does not arrive at the Buyers Factory or godowns within the stipulated time, the weight taken by the Buyers representative will be final and binding on Sellers.

12. REJECTION:

Should any lot or consignment of the goods received under this contract be rejected on account of deficiency in Oil below 14% and or excess of Sand & Silica over 12% as provided in Clause 8, the Buyers shall have the right to ask Sellers to replace the goods under the contract, or tender R/R in replacement thereof within 10 days of written intimation of rejection by Buyers. The rejected goods shall be removed from the Buyers Factory within a period to be specified by the Buyers which shall not be less than five days from the date of rejection. Before removal or rejected goods, Sellers shall reimburse the Buyers full value of the goods (if paid), freight, transport, and other charges if any incurred. The Buyers may charge reasonable interest and godown charges for rejected goods until they are lifted by Sellers and payment reimbursed.

13. DEFAULT:

In the event of the Sellers failing to complete the delivery of the entire quantity of goods or part thereof within the time stipulated in clause 5, and/or failing to replace the rejected goods in terms of this contract within the period of ten days from the date of rejection, the Seller shall be deemed to have committed a breach of contract to the extent and in respect of the goods so remaining undelivered and the Buyers shall be entitled to treat the contract as at an end to the said extent and also entitled either:

- i) to treat the contract as cancelled without requiring Sellers to pay compensation for breach of contract or
- ii) to grant to Sellers extension of period of delivery in case of rejected lots, such extension to be asked for by the Sellers and granted by the Buyers latest upto the last date of contract or
- iii) to buy the undelivered quantity on Sellers' account within five days of the expiry of the delivery period or the period allowed to Sellers for replacement of the goods at Buyers option and recover from the Sellers the difference between contract price and purchase price, or
- iv) without actually buying the undelivered quantity in the market, to recover from the Sellers the difference between the contract price and the price ruling on the last day of the original due date, or the replacement period of the extended date.

14. ARBITRATION: (a) In the event of dispute arising out of this contract reference shall be made to two arbitrators, one each selected by Buyers or Sellers and the arbitration so selected shall be from amongst the panel of arbitrators appointed by the Solvent Extractors' Association of India and in the event of Arbitrators not agreeing the matter should be referred to the sole decision of an umpire who shall also be from amongst the panel of arbitrators appointed by the Solvent Extractors Association of India. For the purpose of arbitration, the Managing Committee of Solvent Extractors Association shall appoint a panel of arbitrators who may be either members of the Association and/or persons interested in the Oilcake Trade.

(b) The arbitration shall be as in the Indian Arbitration Act in force from time to time.

(c) In the event of one of the parties refusing to appoint an arbitrator or neglecting to do so for ten days after the notice in writing of such an appointment by disputing party to the Secretary, Solvent Extractors' Association of India, the Chairman, or in his absence Honorary Secretary of Solvent Extractors Association of India shall appoint on behalf of the party refusing to appoint an arbitrator even though called upon to do an arbitrator from amongst the panel of arbitrators appointed by the Solvent Extractors' Association of India.

(d) The arbitration proceedings will be held in Bombay unless otherwise mutually agreed upon by both the Arbitrators and the parties to the arbitration.

15. DAMAGE
CLAIM:

If the goods received are damaged in transit by fire, water, etc., the Buyers will endeavour to obtain the claim memo from the Railway on Sellers account and cost. The Buyers do not hold responsibility for recovering of claim or accept damaged goods. The Sellers shall immediately repay the advance amount drawn and any other expenses incurred on behalf of Sellers and will remove the goods within Seven days from Buyers premises.

16. JURISDICTION:

Buyers and Sellers agree that for the purpose of proceedings either legal or by arbitration, this contract shall be deemed to have been made in Buyers jurisdiction. All disputes relating to this contract shall be settled according to the law in force from time to time as per the Jurisdiction of Buyers' territory.

SELLERS.

BROKERS.

BUYERS.

APPENDIX-3

PURCHASE CONTRACT OF RAW RICE BRAN

CONTRACT NO.

DATED:

Messrs.

.....

.....

Dear Sirs,

1. We,(hereinafter called the Buyers) confirm having purchased from Messrs. (hereinafter called the Sellers) through..... the undermentioned goods on the terms and conditions mentioned below:

2. QUALITY: Raw Rice Bran, fresh, free from admixture, warranted to contain not less than 16% Oil and not more than 5% Sand and/or Silica.

3. QUANTITY:M.Tons..... bags each ofkgs. Gross/Nett.

4. PRICE: Rs.per M.Ton (including taxes and/or duties) gross weight/nett weight, delivered at Buyers Factory Godown at...../Sellers godown at/F.O.R...../including siding charges wherever applicable.

5. DELIVERY: (a) Despatch during.....to.....
(b) R.R. to be tendered by the Sellers on or beforeto the Buyers at their Office
.....

(c) Delivery before at
 R.R. shall be tendered before 2.30 p.m. on working week days and before 1.00 p.m. on Saturdays. The responsibility for demurrage upto 1.00 p.m. of the next working day of the Railway following the date on which the R.R. is tendered shall be on Sellers Account. If R.Rs. are tendered or presented after the above timings, they shall be deemed to have been delivered on the next working day of the Railway.

6. **PACKING:** Uniform, in new single gunny bags/sound second hand gunny bags to be supplied by the Buyers/Sellers at their cost.
7. **PAYMENT:** 60%/80% at Buyers option, against Railway Receipt or delivery of the goods and balance on finalisation of weight and analysis.
8. **QUALITY ALLOWANCE:** Should be the whole or any portion not turn out equal to warranty as stated in clause 2 above, the goods must be accepted at an allowance to the Buyers at the following rates:-
- (a) For any deficiency in percentage of Oil below 16% the Sellers will pay an allowance of Rs. per ton (price of Bran per ton divided by guaranteed minimum Oil percentage basis) per each percent of deficiency in Oil and proportionately for any fraction thereof. Buyers will reject the goods if the Oil content is below 12%.
- (b) For any excess of Sand and/or Silica over 5% the Sellers will pay an allowance of 2% of the contract price for each percent of excess and proportionately for any fraction thereof. The Buyers will have the right to reject the goods if the Sand and/or Silica content is in excess of 8% or accept with 3% allowance for each unit of Sand and/or Silica in excess of 8% and proportionately for any fraction thereof.

9. QUALITY
PREMIUMS:

- (a) For any excess of Oil content over 16%, the Buyers will pay a premium of Rs. (price of Bran per ton divided by 32 i.e. twice the guaranteed minimum Oil percentage basis) for each percent of excess oil and proportionately for any fraction thereof.
- (b) For Sand and/or Silica content below 5% the Buyers will pay a premium of 3% of the contract price for each percent of Sand and/or Silica contents less than the maximum guaranteed percentage of 5% and proportionately for any fraction thereof.

10. SAMPLING &
ANALYSIS:

For the purpose of drawing samples the Sellers shall, within 48 hours of receipt of the written or telephonic intimation of the Buyers informing arrival of goods at the Factory, depute their representative to the Factory of the Buyers. Four samples will be drawn jointly at the Buyers/Sellers Factory or Godown or at the place of delivery by the representatives of the Buyers and the Sellers from each wagon load/lot/lorry and sealed, and each one of them shall be numbered. In case the Sellers representative is not present as provided hereinabove the samples will be drawn by the Buyers representative and sealed. These sealed samples will be binding on both parties for analysis reports as provided below. One sealed sample will be taken by Buyers for Analysis; Sellers shall arrange to collect the second sample and the other two will be retained by the Buyers. The Buyers will report to the Sellers in writing within 20 days after sealing of the samples the result of the first analysis. In case the Sellers so desire, they may send the second sealed sample to any one of the following laboratories:

BOMBAY:

- 1) Messrs. Therapeutics Chemical Research Corporation, Bombay-8.
- 2) Messrs. J. Parikh & Co., Bombay-9.
- 3) Messrs. Italab (Pvt.) Ltd., Bombay-1.

MADRAS:

- 1) Messrs. Therapeutics Chemical Research Corporation.
- 2) Messrs. Madras Oil Seeds Association, Madras.
- 3) Messrs. Italab (Pvt.) Ltd., Madras.
- 4) Messrs. Superintendence Co. of India.

CALCUTTA: 1) Messrs. R.V. Briggs Ltd., Calcutta-1.
 2) Messrs. Italab (Pvt.) Ltd., Calcutta.
 3) Messrs. Superintendence Co. of India.

VIZAG: 1) Messrs. Therapeutics Chemical Research Corporation.
 2) Messrs. Superintendence Co. of India.
 3) Messrs. Italab (Pvt.) Ltd.

Under intimation to the Buyers in writing within 7 days of receipt of Buyers Report. On receipt of the second analysis result, which shall be communicated to the Buyers within 5 days, the Buyers may accept the same or forward the third sealed sample for third analysis only if the difference on any item between the first and second analysis is more than 1/2%. Such Third analysis will be called for only for that particular item of test which is in dispute in previous two analysis. Sellers will also have similar right to opt for third analysis for which Buyers will forward their sample, if difference between first and second analysis is more than 1/2% and Sellers to inform Buyers of their desire to exercise such option at the time of sending analysis report of the second sealed sample to the Buyers. In case third analysis is undertaken the mean of the nearest two analysis of the three shall be taken as final and binding on both parties. The cost of first analysis shall be borne by the Buyers. The cost of second analysis shall be borne by the Buyers if the Result of the second analysis report exceeds by more than 1% of the first analysis report, taking the first analysis result as basis; and the cost of third analysis shall be borne by the party against whom the third analysis is reported, taking the mean of the first and second analysis as basis.

11. WEIGHMENT: For the purpose of weighing the Sellers shall within 48 hours of receipt of the written or telephonic intimation of the Buyers informing arrival of goods at the Factory, depute their representative to the Factory to Buyers. Weighment of goods will be made at Buyers/Sellers Factory or Godown or at the place

of delivery in presence of Buyers/Sellers representative if present, at the time of weighment. Ten percent of the total number of bags selected at random from each lot shall be weighed and the weight of the whole lot determined on the basis of such ten percent weighment. If, however, the Buyers find that the weights of the different bags vary by more than two percent from the approximate uniform weight, full weighment may be made for which extra cost shall be borne by the Sellers. In case Sellers desire to have full weighment made, it shall be made for which cost shall be on their account. If Sellers representative does not arrive at the Buyers Factory or godowns within the stipulated time, the weight taken by the Buyers representative will be final and binding on Sellers.

12. REJECTION: Should any lot or consignment of the goods received under this contract be rejected on account of deficiency in Oil below 12% and or excess of Sand and Silica over 8% as provided in Clause 8, the Buyers shall have the right to ask Sellers to replace the goods under the contract, or tender R/R in replacement thereof within 10 days of written intimation of rejection by Buyers. The rejected goods shall be removed from the Buyers Factory within a period to be specified by the Buyers which shall not be less than five days from the date of rejection. Before removal or rejected goods, Sellers shall reimburse the Buyers full value of the goods (if paid), freight, transport, and other charges and godown charges for rejected goods until they are lifted by Sellers and payment reimbursed.

13. DEFAULT: In the event of the Sellers failing to complete the delivery of the entire quantity of goods or part thereof within the time stipulated in clause 5, and/or failing to replace the rejected goods in terms of this contract within the period of ten days from the date of rejection, the Seller shall be deemed to have committed a breach of contract to the extent and in respect of the goods so remaining undelivered and the Buyers shall be entitled to treat the contract as at an end to the said extent and also entitled either:

- i) to treat the contract as cancelled without requiring Sellers to pay compensation for breach of contract or
- ii) to grant to Sellers extension of period of delivery in case of rejected lots, such extension to be asked for by the Sellers and granted by the Buyers latest upto the last date of contract or
- iii) to buy the undelivered quantity on Sellers' account within five days of the expiry of the delivery period or the period allowed to Sellers for replacement of the goods at Buyers option and recover from the Sellers the difference between contract price and purchase price, or
- iv) without actually buying the undelivered quantity in the market to recover from the Sellers the difference between the contract price and the price ruling on the last day of the original due date, or the replacement period of the extended date.

14. **ARBITRATION:** (a) In the event of dispute arising out of this contract reference shall be made to two arbitrators, one each selected by Buyers or Sellers and the arbitration so selected shall be from amongst the panel of arbitrators appointed by the Solvent Extractors' Association of India and in the event of Arbitrators not agreeing the matter should be referred to the sole decision of an umpire who shall be appointed by the Arbitrators and who shall also be from amongst the panel of arbitrators appointed by the Solvent Extractors Association of India. For the purpose of arbitration, the Managing Committee of Solvent Extractors' Association shall appoint a panel of arbitrators who may be either members of the Association and/or persons interested in the Oilcake Trade.

(b) The arbitration shall be as in the Indian Arbitration Act in force, from time to time.

(c) In the event of one of the parties refusing to appoint an arbitrator or neglecting to do so for ten days after the notice in writing of such an appointment by disputing party to the Secretary, Solvent Extractors' Association of India, the Chairman, or in his absence Honorary Secretary of Solvent Extractors Association of India shall appoint on behalf of the party refusing to appoint an arbitrator even though called upon to do so, an arbitrator from amongst the panel of arbitrators appointed by the Solvent Extractors' Association of India.

(d) The arbitration proceedings will be held in Bombay unless otherwise mutually agreed upon by both the Arbitrators and the parties to the arbitration.

15. DAMAGE
CLAIM:

If the goods received are damaged in transit by fire, water, etc., the Buyers will endeavour to obtain the claim memo from the Railway on Sellers account and cost. The Buyers do not hold responsibility for recovering of claim or accept damaged goods. The Sellers shall immediately repay the advance amount drawn and any other expenses incurred on behalf of Sellers and will remove the goods within Seven days from Buyers premises.

16. JURISDIC-
TION:

Buyers and Sellers agree that for the purpose of proceedings either legal or by arbitration, this contract shall be deemed to have been made in Buyers jurisdiction. All disputes relating to this contract shall be settled according to the law in force from time to time as per the Jurisdiction of Buyers' territory.

SELLERS.

BROKERS.

BUYERS.

APPENDIX-IV

No.22
Copyright

THE CATTLE FOOD TRADE ASSOCIATION
(INCORPORATED)
AUDREY HOUSE, 5/7, HOUNDSDITCH, LONDON, E.C.3.
(Affiliated with the London Chamber of Commerce)

CONTRACT FOR RICE BRAN
C.I.F TERMS

LONDON, _____ 19__

I have this day _____
WE _____

1. GOODS.- _____
in new and/or secondhand bags of suitable strength to stand ordinary
wear and tear to port of destination.

RICE BRAN _____ crop

2. QUANTITY. _____ tons of
2,240 lbs.each. Sellers have the option of shipping 5% more
or less.

3. PRICE. At _____ pounds _____ shillings
and _____ pence. (£ : :) per ton
of 2,240 lbs. (or 1,016 kilos) _____
gross weight cost, freight and insurance to _____

4. SHIPMENT. To be made in good condition per steamer and/or steamers,
direct or indirect, with or without transshipment from _____

_____ In the event of less than $47\frac{1}{2}$ tons

being tendered by any one steamer Buyers shall be entitled to refund of any proved extra expenses for lighterage incurred thereby at port of discharge. In the event of more than one shipment being made each shipment to be considered a separate contract, but the margin on the mean quantity sold not to be affected thereby. Should any of the above-mentioned quantity form part of a larger quantity of the same or a different period of shipment of bags of the same mark or of similar quality, no separation or distinction shall be necessary.

5. PERIOD OF SHIPMENT.- As per Bill or Bills of Lading dated or to be dated _____

_____ The Bill of Lading
to be dated when the goods are actually on board.

6. EXTENSION OF SHIPMENT.- The contract period for shipment, if such be 31 days or less, shall, if desired by the Shipper, be extended by an additional period not exceeding eight days, provided the Shipper gives notice, claiming extension by cable sent not later than the next business day following the last day of the originally stipulated period. The notice need not state the number of additional days claimed, and such notice shall be passed on by other Sellers to their Buyers respectively in due course after receipt. The Sellers shall make an allowance to the Buyers, to be deducted in the invoice from the contract price, based on the number of days by which the originally stipulated period is exceeded, as follows: for 1, 2, 3 or 4 additional days, $\frac{1}{2}$ % of the gross c.i.f. price; for 5 or 6 additional days, 1 % of the gross c.i.f. price; for 7 or 8 additional days $1\frac{1}{2}$ % of the gross c.i.f. price. If, however, after having given notice to the Buyer as above, the Seller fails to make shipment within such eight days, then the contract shall be deemed to have called for shipment during the originally stipulated period plus eight days, at contract price less $1\frac{1}{2}$ %, and any settlement for default shall be calculated on that basis.

7. CLASSIFICATION OF VESSELS. - For the purpose of this contract the words steamer and/or steamers are intended to include any first class steamer and/or steamers and/or power engined ships (excluding tankers) classed not lower than 100 A.1 or British Corporation B.S. or top classification in American, French, Italian, Norwegian, or other equal Register, or ships not inferior to these classifications.

8. QUALITY.-_____

* At time of loading to be fair average of the season's shipments of _____ crop, colour not guaranteed.

* At time and place of shipment to be about as per sealed sample marked _____

_____ in the possession of _____

* Strike out clause that does not apply

The Rice Bran is not to be rejected on account of inferior quality except in the case of an excessive percentage of sand and/or silica as provided for below.

Warranted to contain not less than _____% of oil and albuminoids combined and not more than _____% of sand and/or silica.

Should the whole or any portion not turn out equal to warranty the goods must be taken at an allowance to be agreed or settled by arbitration as provided for below, except that for any deficiency of oil and albuminoids there shall be allowances to Buyers at the following rates, viz: 1 % of the contract price for each of the first three units of deficiency under the guaranteed percentage; 2% of the contract price for the fourth and fifth units and 3% of the contract price for each unit in excess of five and proportionately for any fraction thereof and for any excess of sand and/or silica an allowance of one percent. of the contract price for each unit of excess and proportionately for any fraction thereof. When the contents of oil and albuminoids is guaranteed within a margin (as for example 40/42%) no allowance shall be made if the analysis ascertained as herein provided be

not below the minimum; but if the analysis results below the minimum guaranteed the allowance for deficiency shall be computed from the mean of the guaranteed contents. Should the Rice Bran prove to contain more than _____% of sand and/or silica, Buyers to have the option of rejection, in which case this contract is to be null and void for the quantity rejected. For the purpose of sampling and analysis each mark to stand as a separate shipment. The right of rejection provided by this Clause shall be limited to the mark or marks found to be defective.

9. LATENT DEFECT. - The Rice Bran is not warranted free from defect, rendering same unmerchantable, which would not be apparent on reasonable examination, any statute or rule of law to the contrary notwithstanding.
10. SAMPLING AND ANALYSIS. - Samples of each mark to be drawn in accordance with the sampling rules of The Cattle Food Trade Association (Inc.) (such rules forming part of this contract and of which both parties hereto shall be deemed to be cognisant) on or before removal from the ship or quay, numbered and sealed in four portions jointly by Sellers and Buyers, or their representatives. If required by Buyers, any one of the sealed samples shall within ten days of sealing be despatched to the Analyst of the Cattle Food Trade Association (Incorporated) for test. Within ten days of receipt of the Certificate of Analysis of this sample Buyers shall send an official copy thereof to Sellers stating whether they accept this analysis or whether they require a second test. Sellers have the right within ten days of receipt by them of the official copy of analysis, to give notice to Buyers that they require a second test. If a second test is required another of the sealed samples shall be despatched without delay to Dr. Berland Dyer & Partners (1948) Limited for test. The means of the two analysis shall be accepted as final if the variation does not exceed $\frac{1}{2}\%$ but otherwise, at the request of either party, made within ten days of receipt (by them) of official copy of the second analysis, and on notice being given to the other party, a third sealed sample shall be despatched without delay to Dr. Aug. Voilcker and Sons for test, and the mean of the two analysis nearest to each other shall be accepted as final and binding on both parties. The party requiring any of the respective tests shall be responsible for the despatch of the relative sample and shall give (directly or through an agent or representative acting on their behalf) to the Analyst concerned instructions specifying what test/s are

to be carried out (both to be done within the time limit stated hereinbefore), and shall send to the other party an official copy of the relative Certificate of Analysis within ten days of receiving it from the Analyst. Should the Buyers or any agent acting on their behalf fail to despatch samples to the analyst within 10 days of their sealing as above provided then any claim for rejection or for an allowance in respect of any of the matters dealt with herein shall be deemed to have been waived and absolutely barred. Should either party require further tests but fail to make application therefor and to send samples within the time limited as above, then the analysis or the mean of the two then existing shall be deemed to be final. Each analysis shall show the number of the sample analysed. The cost/s of the test/s for each separate warranty shall be borne by Buyers in cases where no allowance is payable but by Sellers if Buyers are entitled to an allowance. Method of analysis to be as prescribed in the Fertilisers and Feeding Stuffs Regulations for the time being in force. Any one of the sealed samples shall be retained for arbitration purposes if required. In case of resales the Notices Clause shall apply.

11. APPROPRIATION.

- a) Notice of Appropriation stating the vessel's name and the approximate weight shipped, shall, within _____ days from the date of the Bill of Lading be despatched (in compliance with sub clause (e) by or on behalf of the shipper direct to this buyer or to the selling agent or broker named in the contract.
- b) Notice of Appropriation stating the vessel's name and the approximate weight shipped, shall, within the said period of _____ days be despatched (in compliance with sub clause (e) by or on behalf of each subsequent seller to his buyer or to the selling agent or broker named in the contract, but if Notice of Appropriation is received by a subsequent seller on or after the _____ day from the date of the Bill of Lading, his Notice of Appropriation shall be deemed to be in time if despatched:-

- (1) On the same calendar day, if received not later than 4 p.m. on any business day, that is to say from Monday to Friday inclusive (not being a Public Holiday), or
 - (2) Not later than the next business day, if received after 4.p.m. or on a Saturday or Sunday or Public Holiday.
- c) A selling agent or broker receiving a Notice of Appropriation shall despatch like Notice of Appropriation in compliance with the provisions of this clause. Where the shipper or subsequent seller despatches the Notice of Appropriation to the selling agent such selling agent may despatch Notice of Appropriation either direct to the buyer or to the broker.
 - d) The Shipper's Notice of Appropriation and every subsequent seller's Notice of Appropriation shall state the date or the presumed date of the Bill of Lading which shall be for information only and shall not be binding, but in fixing the period laid down by this clause for despatching Notices of Appropriation the actual date of the Bill of Lading shall prevail.
 - e) All Notices of Appropriation shall be in writing but, when the parties to the contract are carrying on business in different continents, Notices of Appropriation shall be despatched by telegram, teleprinter, telex or such other method of rapid written communication as shall be available. Every such Notice of Appropriation shall be open to correction of any errors occurring in transmission (provided the sender is not responsible for such errors) and for any previous error in transmission which has been repeated in good faith.
 - f) Should the vessel arrive before receipt of the appropriation and any extra expenses be incurred thereby such expenses are to be borne by sellers.
 - g) When a valid Notice of Appropriation has been received by a buyer, it cannot be withdrawn except with his consent.
 - h) A Notice of Appropriation despatched to the broker named in the the Contract shall be considered an appropriation despatched to the buyer.
- DEFINITION: - For the purpose of this clause the word "shipper" shall mean the-first-seller-to-a-buyer-overseas.

12. PAYMENT.- Payment to be made in cash in _____ of 98% of the provisional invoice amount in exchange for Bill/s of Lading and Policy/ies or Certificate/s and/or Letter/s of Insurance (the latter to be certified by an approved Banker if required by Buyers) on arrival of steamer at destination. Should the steamer not arrive within _____ days from date of Bill of Lading, Sellers shall be entitled to present documents at any date thereafter and Buyers shall thereupon make payment as provided above. The balance to be paid or refunded on rendering of final invoice. Sellers may tender Ship's Delivery Order and/or Ship's Release and/or other Delivery Order/s (the latter to be certified by an approved Banker, if required by buyers) and in the event of any Delivery Order being tendered payment shall be due on arrival of the steamer at destination or on posting of steamer at Lloyd's as a total loss. Buyers agree to accept Bill of Lading containing the Chamber of Shipping War Deviation Clause and/or any other recognised official War Risk Clause.. Should documents be presented with incomplete set of Bills of Lading, payment shall be made provided the delivery of the remaining copy or copies of Bill or Bills of Lading in due course after receipt be guaranteed, such guarantee to be signed, if required by buyers, by approved Bankers.

13. SHIPPING DOCUMENTS.- Sellers shall be entitled to tender the Certificate of a recognised Insurance Company or Broker in lieu of Policy. A "Received for shipment" Bill of Lading may not be tendered in fulfilment of this Contract, unless the goods have been shipped during the contract period of shipment and unless accompanied by proof that the goods are on board. The date of the Bill of Lading shall be accepted as proof of date of shipment in the absence of evidence to the contrary. In the event of Shipping Documents not being available at time of Steamer's arrival at destination, Sellers shall provide documents entitling Buyers to obtain delivery of the goods. and payment shall be made in exchange for same, such payment to be made without prejudice to Buyer's rights under this Contract.

14. **CERTIFICATE OF ORIGIN.**- In the case of goods produced, grown or manufactured in the Commonwealth or in a country whose products are favoured with special terms of entry into the United Kingdom, the Sellers shall ship in such a manner as to preserve the entitlement of the goods to preference, and shall furnish at the time of entry a certificate of origin and/or necessary documents in the form valid at the time of shipment, otherwise they shall be responsible for any duty incurred through the non-production of such certificate and/or documents, such amount to be paid to the Buyers on demand against Customs receipt. Should such certificate and/or documents be subsequently furnished by the Sellers, the Buyers shall at once reclaim the amount of the duty from the Customs and shall repay the money to the Sellers when received.
15. **WEIGHING.**- Final settlement shall be made on basis of gross delivered weights and the goods shall be weighed at place of landing at Port of destination herein named, Sellers having the right to superintend. Any additional weight due to sea accident not to be paid for _____
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16. **INSURANCE.**- Insurance on W.P.A. terms (Institute Cargo Clauses) with 3% franchise (or better terms) including usual Warehouse to Warehouse Clause and including War Risk, to be effected with (at Seller's option) first class Underwriters and/or Companies who are domiciled in the United Kingdom, or who for the purpose of any legal proceedings, accept a British domicile and provide an address for service of process in London, but for whose solvency Sellers are not to be responsible. Claims to be paid in the United Kingdom in the currency of the contract. Sellers to give all Policies and/or Certificates and/or Letters of Insurance provided for in this contract, duly stamped, for not less than 2% over the invoice amount, including freight when freight is payable on shipment or due in any event, ship and/or cargo lost or not lost, and including amount of any war risk premium payable by Buyers. When freight is payable on arrival or on right and true delivery of the goods and the insurance does not include the freight, the Sellers shall effect insurance upon similar terms (such insurance to attach only

in respect of such freight as becomes payable) for the amount of the freight plus two per cent, until the termination of the risk as provided in this clause, and shall undertake that their Policies are so worded that in the case of a P.A. or G.A. claim the Buyers shall be put in the same position as the C.I.F. value plus two per cent. were insured from the time of shipment.

In the event of total loss, constructive total loss, or where the amount of the Policy and/or Policies becomes payable in full, the amount insured in excess of two per cent. of invoice amount shall be for Sellers account and the party in possession of the Policy and/or Policies shall collect the amount of insurance and shall thereupon settle with the other party upon that basis.

Any benefit under the Insurance in respect of loss of weight shall be for Sellers account.

17. WAR RISK INSURANCE.- Any expense for covering War Risk insurance exceeding one half of 1 per cent. to be for account of Buyers. The rate of insurance shall not exceed the rate ruling in London at time of shipment or date of steamer's sailing, whichever may be adopted by Underwriters. Notice of extra expense to be borne by Buyers shall be given by Sellers at the time of appropriating under the contract or not later than three days after the rate has been agreed with Underwriters, whichever may be the later. Failure to give such notice shall invalidate the Seller's claim unless, in the opinion of arbitrators, the delay is justifiable.

Seller's obligation to provide War Risk Insurance shall be limited to the terms and conditions in force and generally obtainable in London at time of shipment.

18. PROHIBITION.- In case of prohibition of export, blockade or hostilities or in case of any executive or legislative act done by or on behalf of the Government of the country of origin or of the territory where the port or ports of shipment named herein is/are situate, preventing fulfilment, this contract or any fulfilled portion thereof so prevented shall be cancelled. In the event of shipment proving impossible during the contract period by reason of any of the causes enumerated herein, Sellers shall advise Buyers without delay with the reasons therefore. If required, Sellers must produce proof to justify their claim for cancellation.

19. **FORCE MAJEURE, STRIKES, ETC.-** Sellers shall not be responsible for delay in shipment of the goods or any part thereof occasioned by any Act of God, strike, lockout, riot or civil commotion, combination of workmen, breakdown of machinery, fire or any cause comprehended in the term "force majeure". If delay in shipment is likely to occur for any of the above reasons, shippers shall give notice to their buyers by cable or similar advice within seven days of the occurrence, or not less than twenty-one days before the commencement of the contract period, whichever is later. The notice shall state the reason(s) for the anticipated delay. If after giving such notice an extension to the shipping period is required, then shippers shall give further notice not later than two days after the last day of the contract period of shipment stating the port or ports of loading from which the goods were intended to be shipped, and shipments effected after the contract period shall be limited to the port or ports so nominated. If shipment be delayed for more than one calendar month, buyers shall have the option of cancelling the delayed portion of the contract or of granting an extension for a further one month, such option to be exercised by buyers giving notice, to be received by sellers not later than the first business day after the additional calendar month. If shipment under this clause be prevented during the further one month's extension, the contract shall be considered void. Buyers shall have no claim against sellers for delay or non-shipment under this clause provided that sellers shall have supplied to buyers, if required, satisfactory evidence justifying the delay or non-fulfilment.

20. **NOTICES.-** Any notices received after 4 p.m. on Monday to Friday or on Saturday shall be deemed to have been received on the business day following and for this purpose Saturday shall be considered a non-business day. A notice to the Broker or Agent shall be deemed a notice under this Contract. All notices given under this Contract are to be given by letter or by telegram or by cable or by telex or other method of rapid written communication. In case of resales all notices shall be passed on without delay by Buyers to their respective Sellers or vice versa.

21. NON-BUSINESS DAYS.- Should the time limit for doing any act or giving any notice expire on a Sunday, Public Holiday or the Saturday before any Public Holiday which shall fall on a Monday or on any day which The Cattle Food Trade Association (Inc.) shall declare a non-business day, the time so limited shall be extended until the first business day thereafter.

22. DEFAULT.- In default of fulfilment of contract by either party, the other, at his discretion, shall, after giving notice by letter or telegram, have the right to sell or purchase as the case may be, against the defaulter and the defaulter shall make good the loss, if any, on such purchase or sale on demand. If the party liable to pay shall be dissatisfied with the price of such sale or purchase or if the above right is not exercised the damages, if any, payable by the party in default shall be settled by arbitration.

In event of default by sellers entitling the buyers to damages such damages shall be based upon the actual or estimated value of the goods on date of default to be fixed by arbitration unless mutually agreed, and nothing contained in or implied under this contract shall entitle the buyers to recover any damages in respect of loss of profit upon any Sub-Contracts made by themselves or others unless the Arbitrators or Committee of Appeal having regard to any special circumstances shall in their sole and absolute discretion award such damages. In the event of default in shipment or delivery, damages, if any, shall be computed upon the mean contract quantity.

23. CIRCLE.- Where a seller repurchase from his buyer or from any subsequent buyer the same goods or part thereof, a circle shall be established as regards the particular goods so repurchased, and the provisions of the Default Clause shall not apply. Subject to the terms of the Prohibition Clause in the contract, if the goods are not declared or having been declared documents are not delivered, the invoices based on contract quantity shall be settled between each buyer and each seller in the circle by a payment by each buyer to his seller of the excess of the seller's invoice amount over the lowest invoice amount in the circle. Such settlement to be made 30 days after

the last day for tendering. Should any party in the circle suspend payment or become bankrupt, or make a composition with creditors, or being a company shall have a Receiver appointed or go into liquidation voluntarily or otherwise (except a voluntary winding-up of a solvent Company for the purpose of reconstruction), the invoice amount for the goods, calculated at the market price on the last day for tendering, shall be taken as the basis of settlement instead of the lowest invoice amount in the circle, such market price to be fixed if necessary by an Arbitrator or Arbitrators appointed by the Council of The Cattle Food Trade Association (inc.). As between the buyers and sellers in the circle the non-delivery of documents by each seller to his buyer shall not be considered a breach of contract.

24. **INSOLVENCY.**- If, before the fulfilment of this Contract, either party shall suspend payment of his debts or commit an act of bankruptcy, the Contract shall forthwith be closed, either at the market price then current for similar goods, or at the option of the other party, at a price to be ascertained by re-purchase or re-sale, and the difference between the Contract price and the closing price shall be the amount payable or receivable under this Contract.

25. **DOMICILE.**- Buyers and Sellers agree that, for the purpose of proceedings either legal or by arbitration, this Contract shall be deemed to have been made in England, and to be performed there, any correspondence in reference to the offer, the acceptance, the place of payment, or otherwise notwithstanding, and the Courts of England or arbitrators appointed in England, as the case may be, shall, except for the purpose of enforcing any award made in pursuance of the arbitration clause hereof, have exclusive jurisdiction over all disputes which may arise under this Contract. Such disputes shall be settled according to the law of England, whatever the domicile, residence or place of business of the parties to this Contract may be or become. Any party to this Contract residing or carrying on business elsewhere than in England or Wales, shall for the purpose of proceedings at law or in arbitration be considered as

ordinarily resident or carrying on business at the offices of The Cattle Food Trade Association (Incorporated), and if in Scotland, he shall be held to have prorogated jurisdiction against himself to the English Courts; or if in Ireland to have submitted to the jurisdiction, and to be bound by the decision of the English Courts. The service of proceedings upon any such party by leaving the same at the office of The Cattle Food Trade Association (Incorporated) together with the posting of a copy of such proceedings to his address abroad, or in Scotland or in Ireland, shall be deemed good service, any rule of law or equity to the contrary notwithstanding.

26. **ARBITRATION.**— (a) All disputes from time to time arising out of or under this Contract shall be settled by arbitration in London in accordance with the Rules and Regulations of The Cattle Food Trade Association (Incorporated), which are endorsed hereon, and are deemed to form part of this Contract.

(b) Neither party hereto, nor any persons claiming under either of them, shall bring any action or other legal proceedings against the other of them in respect of any such dispute until such dispute shall first have been heard and determined by the arbitrators, umpire or Board of Appeal, as the case may be, in accordance with the Rules relating to Arbitration endorsed hereon and it is expressly agreed and declared that the obtaining of an award from the arbitrators, umpire or Board of Appeal, as the case may be, shall be a condition precedent to the right of either party hereto or of any person claiming under either of them to bring any action or other legal proceedings against the other of them in respect of any such dispute.

27. **COMMISSION.**— _____ per cent. on the Contract price to be paid by Sellers, ship and/or cargo lost or not lost, Contract cancelled or not cancelled, except in the event of fulfilment of the Contract being rendered impossible under the Prohibition clause.

No. 22

CONTRACT FOR RICE BRAN

(C.I.F. TERMS)

_____19____

I/We acknowledge the receipt of your contract No. _____

dated _____ for purchase from/sale to us of

_____ which

I/We confirm.

To _____

Signed _____

THE CATTLE FOOD TRADE
ASSOCIATION (INCORPORATED).

APPENDIX-5EXTRACTED RICE BRAN - NUTRITIVE VALUE
AND USE IN COMPOUND LIVESTOCK FEEDS.NUTRITIVE VALUE OF EXTRACTED RICE BRAN

The following represents analysis of a fair average sample of extracted rice bran:

Crude Protein, %	14-16
Lysine, %	0.52
Methionine, %	0.30) 0.47
Cystine, %	0.17)
Ether Extract, %	1.0 - 1.5
Crude Fibre, %	10-12
Ash, %	14-16
Acid Insoluble Ash, %	5- 8
Calcium %	0.64
Phosphorous	1.35

Digestible Crude Protein, %	10-11
Starch Equivalent	Cattle 60.0
	Pigs 65.0
Productive Energy:	600/650
Cal/lb.	

COMPARISON OF EXTRACTED RICE BRAN WITH OTHER RAW MATERIALS:

Extracted Rice Bran compares very favourably with other ingredients commonly used in compounding Livestock Feeds, as is shown in the table below:

	S.E. Lbs.	Productive energy Cal/Lb.	Protein %
Cottonseed Cake, Undec.	45	-	24.0
Extracted Rice Bran	60/65	600/650	16.
Fish Meal	-	950	50.0
Groundnut Extraction	70	750	47.5
Groundnut, Expeller	78	850	47.5
Rice Bran	71	900	12.0
Sesame Cake	76	700	36.0
Maize	76	1100	8.5
Wheat Bran	45/60	500	15.0

Based on current prices in India, the economic value of some of the major ingredients used in compounding are as follows:-

Maize Gluton	15	(for the purpose of this exercise extracted rice bran extracted groundnut cake and rice bran were taken as base)
Groundnut Expeller	- 11	
Sesame Cake	-133	
Tapioca	-223	
Wheat Bran	-236	
Undec. Cotton Cake	-308	

Values with a minus prefix are uneconomical and usage of such ingredients is restricted in obtaining a least cost formula.

When no restrictions were placed on the usage of Extracted Rice Bran in the minimum cost formulation by the Linear Programming technique, it was found that the nutritional contents of Extracted Rice Bran made its use in the minimum cost formulation possible even with a wide range of fluctuation in its price. In cattle feed formulations, Extracted Rice Bran was insensitive to a price fluctuation of as high as Rs. 86 with a base price of Rs. 210. In poultry rations, the price fluctuation could be between Rs. 45 to 53. The intrinsic value of Extracted Rice Bran as compared to other ingredients is therefore well proven.

RESEARCH IN INDIA ON USE OF EXTRACTED RICE BRAN

In 1965, evidence was presented at the 2nd Conference of Poultry Research workers in India, that extracted rice bran can be used in poultry feed formulations. Prior to this extracted rice bran was reported to be of use in cattle rations. The usage was in the order of 10%, Even when as high as 30% extracted rice bran was used in rations of dairy cows, the production was as good as obtained on similar quantities of wheat bran and oats.

In experiments with chicks and laying hens it was shown that extracted rice bran supported good growth and egg production, provided rations were made iso-caloric. Rations containing 10-15% extracted rice bran were used in chick trials, where excellent growth was recorded.

Levels of extracted rice bran varying from 10 to 20% supported excellent egg production; The study was conducted with 600 shaver "Starcross" 280 pultets and lasted for 90 days. In this period egg production on all the rations was approximately 75%.

The current usage of extracted ricebran in compounded livestock rations is in the vicinity of 10-20%. Although, the sand/silica level of extracted rice bran is in the range of 5-8% the total silicaous matter entering the ruminant or the chicken is so small that one need not get unduly alarmed by these levels.

In a study completed recently, it was shown that when energy levels are maintained, sand/silica levels (4-10%) did not interfere with optimum growth and feed efficiency. The experiment was run with day old chicks for a period of 4 weeks.

In case of cattle, the silicious matter that passes in the digestive system through roughage or grazing is far greater than what could ever be added through use of current levels of extracted rice bran in cattle rations.

The Industry has made tremendous strides to keep sand/silica levels under control and now that premium is available for better quality, special efforts are being made for reducing the sand/silica further.

Courtesy : Rice Bran Extraction Export House, Bombay.

APPENDIX-6ILLUSTRATION NO. 1 (For Ruminants)

Taking Wheat Bran and G.N. Cake as the standard and assuming their price to be Rs.300/- and Rs.500/- respectively the following will be the Nutritional value (for cattle) of the ingredients mentioned below:

Price of 1 kg. of Digestible Protein is Rs. 1.20

Price of 1 kg. of TDN is ... Rs. 0.24

Now Price of

	DCP	TDN	Nutritional value/M.T. <u>in Rupees</u>
Rice Bran	8	67	248
<u>Deoiled Rice Bran</u>	<u>10</u>	<u>56</u>	<u>250</u>
Maize whole	8	80	368
Cotton seed cake	33	72	535
Molasses	-	55	132
Wheat	11	80	313
Wheat Bran	12	66	300

ILLUSTRATION NO. 2 (For Poultry)

Taking Maize and GN Cake as the standard and assuming their present market price to be Rs.600/- and Rs.500/- respectively the following will be the nutritional value (for poultry) the ingredients mentioned below:

Cost of 1 kg. of Crude Protein Rs. 1.00

Cost of 100 K Cal. of productive energy - Rs. 2.10

	CP	PE	Nutritional cost per M.T. in Rupees.
	—	—	—
Maize	9	1100	600
Rice Bran	12	700	430
Rice Polish	11	1000	570
Wheat Bran	15	500	380
<u>Decoiled Rice Bran</u>	<u>15</u>	<u>500</u>	<u>380</u>
Molasses	-	700	320
Wheat	11	900	524

While talking about a feed ingredient for ruminants the protein quality is not in question. However, the price has to be calculated as per its digestible protein. While considering an ingredient for poultry feed one has to look for a quality protein and also the amount of productive energy it can provide. It is quite indisputable that none of the vegetable sources of protein are complete protein because of inadequacy of one or more of the limiting amino acids. This should be supplemented with other sources of protein. Rice bran or decoiled rice bran can never be the sole source of protein or energy for any kind of simple stomach animals. Therefore as feed manufacturers, while we go for purchasing some commodities we calculate the amount for DCP and TDN for cattle and crude protein and productive energy for poultry. Our money can buy as compared to the standard raw materials largely used for the above specific purposes.

The illustration Nos. 1 and 2 will give an idea as to what price we will pay to buy a feed ingredient so that we can fit the same the most economically to our feed formulation.

From the illustration No. 1 it is evident that if wheat bran and GN cake would cost Rs.300/- and Rs.500/- respectively we can safely pay Rs.250/- for the Decoiled Rice Bran. In other words so far we are buying Decoiled Rice Bran at a rate which is around 5/6th of the price of wheat bran we are safe. (Illustration (1) Anything less than Rs.250/- this is an advantage to the buyer.

While considering the deoiled rice bran for poultry with any amount of conservative calculation its value is Rs.380/- which is equal to wheat bran but $\frac{2}{3}$ of the price of the Maize. However, if the deoiled rice bran will be having about 8 to 9% Sand and Silica and 10 to 12% Crude fiber it should supply around 15% crude protein and about 600 KCal of productive energy /lb. Although the present calculation is based on only 500 KCal of productive energy/lb.

One more point to our advantage in this country that the rice milling in this country is not so advanced therefore considerable amount of broken rice are present in the bran. It is expected that the deoiled rice bran from India would provide more than 600 KCal of productive energy/lb. so far the sand silica % remains below 10% and crude fiber remains below 12%.

Sand and Silica in the deoiled rice bran is unavoidable as some amount husk is always admixed with it and that contributes to the Sand and Silica part of it. The same explanation holds good for the crude fiber part of it too. But so far we are aware that that amount of energy and protein our money buys compared to other standard commodities we need not have to be worried.

Courtesy : Rice Bran Extraction Export House, Bombay.

APPENDIX-7

Analysis of the Essential Amino Acids in Rice Bran & Solvent
Extracted Rice Bran (on moisture - free - basis)

(CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, MYSORE)

<u>Amino Acid Composition</u> (6/16 G.N.)	<u>Rice</u> <u>Bran</u>	<u>Solvent Extracted</u> <u>Rice Bran</u>
Arginine	6.0	6.24
Histidine	1.9	1.9
Lysine	4.2	3.6
Methionine	2.3	2.0
Phenyl Alanine	3.0	3.3
Leucine	2.4	3.0
Isoleucine	4.7	4.9
Valine	5.0	5.5
Threonine	2.9	2.5
Tryptophan	1.1	1.01
Crude Protein %	12.0	14.4

(Note: Results show that effect of processing does not affect the quality of Protein present in the rice bran).

Deoiled Rice Bran

- (1) Supplies quality protein and energy at a comparatively cheaper rate.
- (2) Checks development of rancidity.
- (3) Improves keeping quality of compounded feed during storage, transport and marketing.

Courtesy : Rice Bran Extraction Export House, Bombay.

B. COMPOUND FEEDSIntroduction:

Livestock and livestock products production has tended to become an increasingly complex industry. Farm animals require feed which includes required quantities of protein, essential amino-acids, vitamins and minerals, heat and energy. Different animal species and the same animals at different stages of growth require these in different proportions. The combinations of different ingredients are so formulated as to achieve the most rapid and efficient growth of the animal. In undertaking such a combination of ingredients, careful scientific mixing and even dispersal of the ingredients in the compound, sophisticated equipment and manufacturing techniques have been developed. The advances in the knowledge of animal breeding and feeding techniques have resulted in a shift from direct feeding of a mixture of feedgrains, oilcakes, legumes, bran, etc. by the farmer to the use of ready mixed feeds - compound feeds - manufactured under brand names by the compound feed manufacturing industry. Shortage of labour has been an important factor influencing the growth of these feeding techniques.

As stated in chapter III, the compound feed industry has made rapid strides in all the advanced countries. Economic compulsion (labour shortage) and research and scientific development provided a continuous basis for the expansion of the industry. The principal factor has been the rise in standards of living and increased demand for meat and livestock products.

The World Compound Feed Industry

The data on production of compound feeds in different countries are not comparable because of the variation in the specifications in each countries. The term mixed feed is generally inclusive of both complete feeds to which the farmer is not required to add any further ingredients, mainly grain, - and high protein concentrate mixtures to which the farmer must add grain in order to make a complete and balanced feed. Mixed feeds data analysed below do not include specific mineral mixtures and pre-mixes containing only minerals, vitamins and medicinal additives. Again, mixed feeds do not refer to the production of those individual items, such as oilcakes and simple grains. The data also do not include feeds mixed by livestock producers for use in their own premises. Since production of mixed feeds for pets such as dogs and cats - is negligible, the data do not relate to these products.

Table 1 below gives the production of mixed feed in some countries for the years 1957, 1960 to 1965. Production in other countries is not likely to be of any significant order, though consumption of feed mixed at the farm level composed of grains and high protein feedstuffs is quite substantial. We may, therefore, consider production of mixed feed by organised industries as in Table 1 to be more or less representative of world production. It is emphasised, however, that inclusion of grain for some countries and exclusion in the case of others does not strictly allow for aggregations and comparisons. The proportion of grain in mixed feeds varies widely between 30 to 65 per cent depending on the feed end-use.

World production of mixed feeds recorded an increase being more or less consistent - 9 per cent per annum. The U.S.A. is by far the leading producer of mixed feed; together with a relatively small contribution from Canada, North American output accounted for 68 per cent of world production in 1957. Having already achieved high per animal unit consumption of mixed feed and with large resources of grazing land for the important beef cattle sector, the North American

Table 1
Production of Mixed Feeds in Some Countries 1957. 1960-65

Country	1957	1960	1961	1962	1963	1964	1965
1. U.S.A. ^{2/}	41,610	45,680	47,610	50,868	52,024	50,674	53,100
2. Canada ^{2/}	2,500	2,685	3,042	3,074	3,168	4,790	5,272
3. Total 1 + 2	44,110	48,365	50,652	53,942	55,192	55,464	58,372
North America as % of total	(67.6)	(61.2)	(59.3)	(57.5)	(56.1)	(53.1)	(51.5)
4. West Germany	2,306	3,592	3,853	5,086	4,913	5,576	6,610
5. France	1,640	2,217	2,552	3,131	3,421	4,011	4,552
6. Italy	430	800	900	1,050	1,300	1,500	2,000
7. Netherlands	3,500	4,300	4,600	5,050	4,900	5,370	5,625
8. Luxembourg	-	14	14	19	21	15	49
9. Belgium	1,147	1,550	1,838	2,154	2,009	2,194	2,478
10. E.E.C. Total	9,023	12,473	13,757	16,487	16,564	18,666	21,314
E.E.C. as % of Total	(13.8)	(15.8)	(16.1)	(17.6)	(16.8)	(17.9)	(18.8)
11. U.K.	6,450	8,785	9,103	9,579	9,355	9,467	9,898
12. Austria ^{3/}	68	115	128	155	175	214	279
13. Denmark ^{3/}	987	1,605	1,613	1,593	1,836	3,139	3,277
14. Finland ^{2/}	83	134	109	134	132	127	130
15. Greece	20	70	80	100	130	140	170
16. Ireland	255	333	429	543	549	598	804

(Contd.)

Table 1 (Contd.)
Production of Mixed Feeds in Some Countries 1957. 1960-65

Country	1957	1960	1961	1962	1963	1964	1965
17. Norway	339	562	580	646	671	726	816
18. Portugal	41	68	93	103	180	280	400
19. Spain <u>2/</u>	152	400	700	1,600	2,700	2,800	3,000
20. Sweden <u>4/</u>	282	553	544	500	660	750	848
21. Switzerland	213	243	260	340	380	430	550
Total (11 to 21)	8,945	12,873	13,639	15,353	16,768	18,671	20,172
Other Europe							
% of total	(13.7)	(16.3)	(15.9)	(16.4)	(17.1)	(17.9)	(17.8)
22. Japan	910	2,091	3,408	4,096	5,444	6,643	7,524
% of total	(1.4)	(2.6)	(4.0)	(4.4)	(5.5)	(6.4)	(6.6)
23. Others	2,235	3,186	3,906	3,954	4,357	4,966	5,945
% of total	(3.5)	(4.1)	(4.7)	(4.1)	(4.5)	(4.7)	(5.3)
Total	65,223	78,988	85,362	93,832	98,325	104,410	113,327
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

Note : Data include both complete feeds and high protein concentrate mixtures to which grain must be added to make a complete, balanced feed.

1/ Preliminary

3/ Through 1961, June-May Year, thereafter May-April

2/ Partially estimated

4/ July - June year.

Source : Foreign Agriculture Circular, U.S. Department of Agriculture, Grain, FG 10 - 67.

production did not increase at the same rate as in Western Europe and Japan. Consequently, the share of North America (that is, the U.S.A. and Canada) declined from 68 per cent in 1957 to 61 per cent in 1960 and to 51 per cent only in 1965. Nonetheless, it will be observed that North America alone, still, accounts for over half the world's output of mixed feed in the organised sector.

With the need to increase meat output to cope with rising demand, the mixed feed industry recorded very rapid increases in the Western Europe. In the West European region, the EEC group recorded the most spectacular expansion in its output of mixed feed. The EEC production increased by almost 137 per cent over the eight year period.

Accordingly the share of this group of countries rose consistently from 13.8 per cent in 1957 to 18.8 per cent in 1965. As seen in chapter III, production of mixed feed in the EEC has continued to record a consistently high rate of growth even after 1965.

Production of mixed feed in the rest of Western Europe is dominated by the United Kingdom. As seen in Table 1, the U.K. accounts for slightly less than one-half of the total output of mixed feeds in the rest of Western Europe. Production of mixed feed in the U.K. has, however, been more or less stable since 1962. Production in other Western European countries has, however, trended sharply upward. The expansion has been of an outstanding order in the relatively new entrants into this industry. They are, Spain, Denmark, Ireland, Norway and Sweden. The result has been that group - Other Western Europe - as a whole, recorded an expansion of almost the same order as the ECM group of countries. The share of these countries rose from 14 per cent in 1957 to 18 per cent in 1965. However, it is obvious, considering the production of meat and livestock products on the one hand and techniques of animal feed being adopted, that the growth of the mixed feeds industry will continue upward more or less unabated.

Of all the countries, production of mixed feed in Japan however expanded at an almost spectacular rate, from mere 910,000 tons in 1957 and 2.1 million tons in 1960 to 6 million tons in 1965. We have observed in

the country report on Japan, that production of mixed feed by 1967 exceeded output in the U.K. Japan's share, consequently rose from 1.4 percent of world output in 1957 to 5.3 per cent by 1965.

Production of mixed feed in other countries of the world is still relatively small. In the countries worth mentioning, production in Mexico and Argentina increased from 0.5 to 1.1 million tons in Mexico and from 0.4 to 1.2 million tons in Argentina between 1957 and 1965. Israel, Australia and South Africa, were each able to substantially increase their output but these by 1965 were still below the 1 million ton level.

World
Production
of Mixed Feed
by Type

The breakdown of world production of mixed feed by type is given in Table 2 below. Mixed feed for poultry is by far the largest feed produced in the world, accounting as it does for almost 50 per cent of the total mixed feeds produced in 1965. Cattle feed accounts for slightly more than a quarter of total output and hog or swine-feed accounts for a little over one-fifth. Production of other animal feed, it will be observed, is generally very small. However, this pattern is to a large extent influenced by production in the U.S.A. and the ECM. A closer look,

will show that the pattern varies substantially as between different countries in the manufacture of mixed feeds. Livestock population, the taste factor for different meats (which may itself be mainly as a result of income levels) and the feedstuffs resources in different countries are factors affecting the pattern of animal feed production.

In the case of the U.S.A., swine feed is relatively small part of total output, for the simple reason that U.S.A. does not consume relatively large quantities of pork. Its poultry industry also called broiler industry has expanded rapidly on an organised basis and mixed feed use in this industry is almost the only feeding technique.

In the case of the ECM, as well as other Europe, it will be seen, that swine feed accounts for almost a third of total feed production. In fact, if we exclude the U.K., from other West European countries, production of hog feed accounts for almost half the total output of mixed feed in this latter group (see Table 2). This clearly shows the importance of the pork industry in these countries. Nonetheless, we have observed in Chapter III, that poultry and egg production are

Table 2

Production of Mixed Food by Type 1965 ^{1/}

Country	Total	Poultry ^{2/}	% of Total	Cattle	% of Total	Swine	% of Total	Others	% of Total
1. U.S.A.	53,100	27,600	52.0	15,900	30.0	8,000	15.1	1,600	2.9
2. Canada	5,272	2,077	39.4	1,633	30.9	1,521	28.8	41	0.9
3. Total(1+2)	58,372	29,677	50.8	17,533	30.0	9,521	16.3	1,641	2.9
4. West Germany	6,610	2,815	42.6	1,747	26.4	1,864	28.2	184	2.8
5. France	4,552	1,870	41.1	973	21.4	1,403	30.8	306	6.7
6. Italy	2,000	960	48.0	500	25.0	500	25.0	40	2.0
7. Netherlands	5,625	1,725	30.7	1,625	28.9	2,200	39.1	75	1.3
8. Luxembourg	49	12	24.5	16	32.7	21	42.8	-	-
9. Belgium	2,478	753	30.4	716	28.9	944	38.1	65	2.6
10. E.E.C.Total	21,314	8,135	38.2	5,577	26.1	6,932	32.5	670	3.2
11. U.K.	9,898	4,095	41.4	3,377	34.1	2,253	22.8	173	1.7
12. Other W.Europe	5,745	1,337	23.2	1,505	26.2	2,856	49.7	47	0.9

^{1/} Preliminary^{2/} Includes feed for both egg and meat production

* Refers to Denmark, Ireland, Norway and Sweden

(Contd.)

Table 2 (Contd.)

Production of Mixed Feed by Type 1965 1/

Country	Total	Poultry ^{2/}	% of Total	Cattle	% of Total	Swine	% of Total	Others	% of Total
13. U.K. and other W. Europe*	15,643	5,432	34.7	4,832	31.2	5,109	32.6	220	1.5
14. Japan	7,524	5,033	66.9	845	11.2	1,587	21.1	59	0.8
15. Other countries**	5,605	3,986	71.1	806	14.3	450	8.0	190	3.4
16. Total (above countries)	108,458	52,263	48.2	29,643	27.3	23,599	21.8	2,980	2.7

1/ Preliminary2/ Includes feed for both egg and meat production3/ Includes feed for both milk and beef production.

* Refers to Denmark, Ireland, Norway and Sweden

** Refers to Mexico, Argentina, Columbia, Venezuela, Israel, Philippines, Australia and South Africa. In the group, other countries, percentages do not add up to 100, because of data being not available for some countries.

Source : Foreign Agriculture Circular, U.S. Department of Agriculture, FG - 10-67

witnessing a rapid increase in the livestock output of these countries. Production of poultry in the broiler form of industry will make for a continued expansion in the share of poultry feed.

In the case of Japan and other countries of the world, where mixed feeds are produced, Table 2 shows an overwhelming importance of poultry feed. While the predominance of "poultry feed" and its growing importance will have its impact mainly on grains, soyabean meal and fishmeal, "cattle and hog feeds" where oilcakes play a relatively important role continue to account for a very substantial part of mixed feed output.

"Expansion of mixed feed production world-wide can be expected to follow the increase in demand for livestock products, which is projected to continue through 1970 and as far as 1975. The rising trend in disposable incomes, the more desirable forms in which products are presented to the public, and changes in buyers' tastes are pushing per capita consumption of livestock products to higher levels. This, along with population growth, increases the market demand for eggs

and poultry, dairy products, beef, pork and other livestock products."^{1/} Though this will certainly have profound impact on the demand for feedgrains, "mixed feed production must also continue to expand, particularly in the grain deficit areas where efficient utilisation of feeds is especially important."^{2/}

World Trade
in Compound
or Mixed Feeds

At the very outset, it must be pointed out that information on world trade in mixed feeds tends to be very scanty. The commodity is included under the category "other animal feedstuffs", which may include anything like farm by-products, fodder or hay, alfalfa meal, oilcakes not specified or fishmeal. The commodity is traded in such small quantities that it is rarely specified separately in the trade returns of most countries. Most knowledgeable sources clearly vouch that world trade in mixed feeds is generally very small. The very nature of the product-its ingredients, nutritive requirements variation as between different countries, availability of domestic feed additives etc. on the technical side and relative prices of ingredients and

^{1/} Foreign Agriculture Circular : U.S.Department of Agriculture, Grain; FG 10-67.

^{2/} Ibid. p. 7.

marketing aspects, trade barriers in the form of tariffs etc. on the economic side rule out scope for large trade in compound feeds. Sporadic trade takes place off and on as between the developed countries themselves, depending on shortages occurring from time to time.

From scanty data, it would appear that the U.S.A. is the only country, having a consistent export trade in mixed feeds. Others reporting limited exports from time to time are the United Kingdom, Canada, Australia, Belgium and Japan. None of these countries export more than 10,000 tons of mixed feed per annum.^{3/} For example, exports of mixed feed from Australia were 8,000 tons in 1963-64, Belgium - 6,000 tons in 1964, Canada 8,400 tons of dairy and cattle feeds and 4,500 tons of mixed feeds from Japan in 1963. The U.K. exported over 84,000 tons of animal feedstuffs in 1962. Though this figure excludes oilcakes, unmilled cereals and fish and meat meal, it includes all other animal feedstuffs being mixed or compound feeds. On the side of imports, Japan, Mexico, Hong Kong and Latin America are relatively important mixed feed importers. No reliable data on imports of mixed feeds as such ~~into~~ these countries are

^{3/} Animal Feeds, II F.T. Commodity Series No.5, Indian Institute of Foreign Trade, pp. I-X.

at present available. However considering that the U.S.A. is, at present by far the largest exporter, an examination of the distribution of its exports over time can give a rough idea of the scope for exports of mixed feed.

Table 3 below gives U.S. exports of mixed feeds by type:

Table 3
Feeds, Prepared and Mixed : U.S. exports

('000 Tons.)

	Average 1955-60	61-62	62-63	63-64	64-65	65-66
Corn feeds	22.6	51.0	121.5	151.5	200.4	352.9
Poultry feeds	92.8	108.3	114.4	129.4	160.4	210.5
Wheat feeds ^{1/}	43.7	27.6	42.6	16.6	31.8	74.3
Dairy feeds ^{1/}	6.7	6.9	7.2	6.7	13.4	20.6
Fodders & other feeds	181.9	254.0	540.1	494.0	501.1	460.7
Total	347.9	447.6	825.6	798.3	907.1	1119.0

^{1/} Four-year average 1956-60, Fiscal year 1955-56 is included with "Fodders and Feeds, N.E.C."

Source: Foreign Agriculture Circular : U.S. Department of agriculture, Grain FG. 7-67.

Exports of prepared and mixed feeds from the U.S.A. reached a record level of 1.1 million tons in 1965-66. Exports of fodders and other feeds (including concentrates

and by-products of the milling industry) accounted for, by far, the largest proportion of 41 per cent of the total in 1965-66. Shipments of corn feeds and poultry feeds were substantial accounting for 32 and 19 per cent respectively, of the total for 1965-66. Exports of wheat and dairy feeds, however, accounted for another 8 per cent. From the very nature of classification, it will be observed that the products are by no means such that the unit value is relatively higher than in the case of oilcakes, the value added component may be generally considered to be of a very limited proportion of the price of the final product.

For the purpose of the analysis below, we have presented data on exports of poultry and dairy feed exports from the U.S.A. to the important importing countries. The inclusion of all feed, as in Table 3, would be misleading, keeping in view the objectives in exploring the scope for exports of compound feeds from India. Most of the U.S. exports of mixed or prepared feeds are directed to the West European countries. Poultry feeds find their markets in the Latin American group of countries, more than 50 per cent of total U.S. exports (see Table 4). The Asian countries account for

VI. 27

Table 4U.S.A. : Country-wise Exports : Poultry Feeds, Prepared or Mixed 1/

(000 metric tons)

Region/Country	1961-62	1962-63	1963-64	1964-65	1965-66
<u>Western Hemisphere</u>	24.6	83.8	34.1	90.3	103.6
Mexico	10.9	15.4	19.2	19.7	23.1
Guatemala	3.7	3.0	4.1	4.0	5.0
Bermuda	5.6	5.3	5.1	2.4	3.1
Bahamas	4.3	5.3	6.4	7.6	8.6
Dominican Republic	0.7	1.8	4.4	6.4	7.5
Jamaica	16.2	17.3	17.4	12.8	15.3
Netherlands Antilles	5.6	5.1	5.0	5.2	6.7
Trinidad & Tobago	15.2	9.9	9.9	6.6	6.3
Guyana	4.4	2.8	3.7	4.4	5.0
Others	17.4	17.9	18.9	21.2	23.0
<u>E.E.C.</u>	1.3	3.6	2.5	5.6	4.6
<u>Other Western Europe</u>	4.0	4.6	6.2	12.2	13.8
<u>Asia</u>	14.2	18.8	24.2	50.2	85.5
Hong Kong	5.3	8.5	7.6	9.4	12.1
Japan	2.6	0.4	1.7	17.3	42.5
Lebanon	5.6	8.1	11.6	16.1	17.4
Saudi Arabia	Neg.	Neg.	0.5	2.3	4.7
Others	1.7	1.8	4.6	5.1	8.8
<u>Africa</u>	2.0	3.1	1.1	1.4	1.6
<u>Other Regions</u>	0.9	0.4	0.7	0.8	1.2
World Total	108.0	114.4	129.4	160.4	210.3

1/ Includes feather meal, mash, laying mash and Turkey pellets.

Source: Foreign Agriculture Circular, U.S. Department of Agriculture,
F.G. 7 - 67.

Neg. = Negligible.

another 40 per cent, with Japan being, by far the largest market for poultry mixed feeds. The EEC and other West European markets are relatively small importers. The share of Africa is negligible. In terms of growth, the U.S. exports of poultry mixed feed almost doubled over the period 1961-62 to 1965-66. The Latin American imports which were already large in 1961-62 increased by 22 per cent over the five years period. The Asian imports, over the same period, however, recorded a marked expansion of 463 per cent. The U.S. exports of dairy feeds continue to be limited - 21,000 tons in 1965-66, though they did grow rapidly from a mere 7,000 tons in 1961-62. The market structure in the case of dairy feeds is more or less the same in the case of poultry feeds. The countries within Latin America and Asia together absorb almost the entire U.S. exports of mixed dairy feeds.

Exports of fodders and other feeds (including concentrates) are shown to be the largest single type of prepared or mixed feed exports from the U.S.A. and, over the past four years exports were between 450,000 and 500,000 tons per year. These large exports are explained as being mainly due to the greater use of

Table 5U.S.A. : Country-wise Exports : Dairy Feeds, Prepared or Mixed ^{1/}

(000 tonnes)

Region/Country	1961-62	1962-63	1963-64	1964-65	1965-66
<u>Western Hemisphere</u>	4.6	4.0	4.4	9.2	9.6
Canada	1.2	0.8	0.4	0.6	0.7
Mexico	0.4	0.2	0.1	1.6	1.3
Bahamas	0.4	0.5	0.6	0.5	0.4
Barbados	0.4	0.2	0.2	0.3	0.5
Barmuda	0.1	0.2	1.4	4.1	4.8
Jamaica	0.1	0.2	0.4	0.4	0.4
Others	2.0	2.1	1.3	1.7	1.5
<u>E.E.C.</u>	0.9	1.9	0.9	0.9	1.8
<u>Other Western Europe</u>	0.9	0.9	0.9	0.8	0.7
<u>Asia</u>	0.4	0.4	0.5	2.4	8.4
Japan	Neg.	Neg.	Neg.	1.4	8.1
Others	0.4	0.4	0.5	1.0	0.3
<u>Africa</u>	Neg.	Neg.	Neg.	Neg.	0.1
Others	0.1	0.2	0.2	0.1	0.1
World Total	6.9	7.0	6.9	13.4	20.6

^{1/} Includes calf meal, Con-d. Mineral, Mixed Cattle feed, prepared or mixed cow feed and Hon- E. Mix.

Source : Foreign Agriculture Circular, U.S. Department of Agriculture, FG 7-67.

Neg. = Negligible.

alfalfa meal and pellets which are manufactured from dehydrated alfalfa and used extensively in poultry feeds as supplemental source of vitamin A, xanthophyll and protein. The remarkable growth in alfalfa production in the U.S.A. (1.8 million tons in 1965-66) is explained as being mainly due to the rise in import demand for the product - Japan and the Netherlands being the main buyers. A breakdown by ingredients of fodders and feeds, N.E.C. exported by the U.S.A. for 1965-66 shows that dehydrated and sun-cured alfalfa meal accounted for 41 and 35 percent of the total shipments of 460,000 tons, unmilled cereal grains accounted for a further 7 percent.

Factors Restricting World
Trade in
Compound Feeds

There are many factors which appear to restrict large-scale world trade in complete, and balanced animal feedingstuffs. Most of the countries who use compound feedstuffs for animals are in the category of advanced countries. These countries have their own compound feed manufacturing industry, developed to a sophisticated level. Several ingredients of mixed feed are available to them through domestic production - viz. grains and chemical additives, or imports - directly and indirectly, oilcakes and fishmeal. These countries, therefore, prefer to manufacture their own feedstuffs, by

supplementing domestically available ingredients and imports of other ingredients rather than the imports of complete balanced feeds.

Moreover requirements of nutrients and additives like antibiotics, minerals and vitamins for the same animal categories may differ from country to country, depending on climatic and other environmental conditions. Compound feeds sold under brand names are generally evolved over fairly long periods through the process of experiments to achieve healthy growth of animals. Under these conditions, large-scale use of imported compound feedstuffs do not appear feasible unless feed manufactures in exporting countries gear their production to the requirements of each importing country. This is a difficult task unless experiments are carried out under the same environmental conditions as in the importing countries and with the same animal species.

The importance of the above factors are clearly evident in the strict legislative and administrative controls exercised within national boundaries in most advanced countries. The object of these regulations are "either to protect the purchaser against fraud or to guarantee him the availability of good quality products

or to achieve both these objectives simultaneously."^{4/}

Manufacturers of mixed feeds and dealers in these products are under the "obligation to carry out certain formalities aimed at uniformity in the application of rules : prior license from the competent authorities before commencing their operations, notification of their activities or registration of their products with the authorities, keeping special books, submission of documents for inspection, etc."^{5/} Again in several countries the buyer is accorded various guarantees including the right to be informed of details of the products he buys and, often, to require that they be of satisfactory quality and do not contain dangerous or harmful substances. The details to be supplied to the buyers are usually required to be given on a label or printed on each container or package, or on invoice, or display card, etc. Where the feedingstuff is easily susceptible to falsification or adulteration, the details and specifications required are even more numerous.

"Several countries list substances whose use is forbidden in order to safeguard animal health while the majority

^{4/} Richard R., French M.H. U.N. F.A.O. "Animal Feedstuffs-Regulations Governing Their Manufacture and Sale in European countries, Rome 1963.

^{5/} Ibid.

lay down minimum and maximum content of given ingredients".^{6/} Almost invariably, products not confirming to prescribed specifications or standards are prohibited for manufacture or sale without a prior clearance from the competent authorities. A breach of regulation renders manufacturers and traders liable for punishment under law. An even more rigorous control over production and trade is exercised when the feeds contain active components like vitamins, antibiotics, coccidiostats, hormones, etc., since the excessive use of these is dangerous not only for the animals but more importantly for human beings, consuming the meat of such animals.

Lastly, as in the case of most other primary and food products, trade restrictions tend to be much more firm on processed products or animal mixed feeds in this case, than on the ingredients. The import duty on compound feed, it is reliably learnt, tends to be high but varying as between different countries. The Scandanavian countries - Denmark, Norway and Sweden and Switzerland and Japan - have also imposed non-duty trade barriers. These import restrictions are known to

^{6/} Ibid.

effectively restrict the international trade in mixed or prepared animal feedstuffs.

Under these conditions, international trade in compound feedstuffs for animals cannot, but be limited. The distributors of imported feedstuffs can scarcely be expected to vouch for quality of imported products, nor would they like to risk punishment for breaches of regulations committed by foreign manufacturers over whom there is limited control.

The Compound
Feed Industry
in India

The compound feed industry in India is composed of: (1) the organised mixed feed units in the private sector; (2) feed mixing units set up by the states' animal husbandary departments; and (3) units undertaking hand mixing of feedstuffs in the unorganised sector.

The organised units in the private sector have modern equipments for manufacturing compound feeds, although they are not as thoroughly mechanised or sophisticated as in the advanced countries of Europe, U.S.A. and Japan. The number of such compound feed units in India was 19 in 1967-68. All these units are members of the Cattle Feed Manufacturers Association of India. Of these 19 units, one is to enter into production shortly and another is yet at the plant erection stage.

Of the 19 units in the organised sector, four are located in Bombay, two in Delhi, three in Madras, one each at Kanpur, Coimbatore, Hyderabad, Bangalore, Indore, Davangere, Anand, Dharwar, Hubli and Bhavnagar. The units are listed in Appendix 1.

For the purpose of this study, we undertook a quick survey of the industry in India. A questionnaire issued in this survey is given as Appendix '2'. Though 12 units were contacted, only 9 returned the questionnaires, giving full information. Unless otherwise specified, the data and analysis as given below relate to these 9 units. Fragmentary information was obtained from others. "Animal Feeds" a commodity study prepared by the Indian Institute of Foreign Trade - was also useful in providing some data of the industry. Of the nine units which responded to our questionnaire, only one was installed in 1954. One each was set up in 1960, 1961 and 1964 and 1967, and two each were set up in 1963 and 1965.

The units are of varying sizes as evidenced by their installed capacities and capital investment.

Installed
Capacity

The installed capacity in terms of 24 hours running per annum (of 300 working days) of 14 units operating in 1964-65 was about 3.3 lakhs tonnes of compound feed. The actual production, however, was only about 47,178 tonnes. The present installed capacity of the 19 units in the organised sector in 1967-68 is estimated at 5.1 lakh tonnes of compound feeds. Production in 1967 is estimated at 1.53 lakh tonnes. The total production of all the organised units over the last four years was estimated as follows:

<u>Year</u>	<u>Production ('000 tonnes)</u>
1964	39.8
1965	80.6
1966	111.2
1967	153.0

The capacity ranges of the nine units surveyed are shown below:

<u>Ranges of Annual Capacity</u>	<u>No. of Units</u>
Less than 10,000 tonnes	1
10,000 tonnes to less than 20,000 tonnes	2
20,000 tonnes to less than 30,000 tonnes	1
30,000 tonnes to less than 40,000 tonnes	3
40,000 tonnes to less than 50,000 tonnes	Nil
50,000 tonnes to less than 60,000 tonnes	1
72,000 tonnes	1
Total	9

Capital
Investment

The compound feed plants are a combination of grinding, mixing and pelletizing units. The necessary ingredients are ground, mixed and pelletized. Except for the pelletizer, which is imported, all other equipments are manufactured in India. A standard size plant with an annual capacity of 36,000 tonnes is estimated to cost about Rs. 9 lakhs; the import component accounts for about Rs. 1 lakh.

It has not been possible to estimate the total capital investment in this industry because many units are composite units processing other products like oilcakes. The cost of plant and machinery used for compound feed manufacture varies from Rs. 60,000/- in one unit to Rs. 43 lakhs in another.

Three of the units use indigeneous equipments; the rest use imported machinery. Two of them have imported machinery from the United States, two have imported from Switzerland and the remaining two from West Germany.

Production of
Compound Feeds

Production of compound feeds by the organised units, though still very low in absolute terms, has expanded very rapidly over the past few years. Table 6 shows the trends in total production as well as that in the type of feed produced by the 9 units surveyed.

Table 6
Production of Compound Feeds in India

(in tonnes)

Year	Cattle Feed	Poultry Feed	Other Feed	Total
1961	2,280	100	-	2,380
1962	9,724	350	5	10,079
1963	10,281	2,400	10	12,691
1964	13,673	12,737	150	26,560
1965	32,857	24,128	708	56,963
1966	54,299	32,417	903	87,349
1967	62,005	36,391	1,252	100,648

Production of the compound feed industry in India it will be observed, is mostly concentrated in cattle and poultry feeds. These two types of feed together account for almost the entire output of the industry. Of the nine units surveyed, all produce cattlefeed, while

eight produce poultry feed also. Of these eight units only one produces hog feed. In 1960-61, almost the entire output was composed of cattle feed only. Since then, however, production of poultry feed expanded relatively faster. The share of poultry feed in the total compound feed rose to 48 per cent in 1964. But, since 1964, production of cattle feed once again made a headway and its output almost doubled between 1964 and 1967. Production of poultry feed over the same period also increased by 50 per cent. Production of other animal feeds, still accounts for an insignificant proportion of the total output.

The products of four of the nine units surveyed are subject to specifications laid down by the Indian Standards Institute. The rest of the units do not follow ISI specifications.^{7/} Almost all the units, however, have their own laboratories to test raw materials and finished products.

^{7/} Indian Veterinary Research Institute, Izatnagar, and the National Dairy Research Institutes at Bangalore and Karnal etc. are presently engaged in research of the nutritional requirements of various classes of animals. On the basis of the investigations already carried out by such institutes, the ISI has devised a number of formulas for certain poultry and cattle-feeds and these have been laid down in Indian Standards specification IS: 1374 - 1964 and IS: 2052 - 1962 respectively. A detailed list of Indian Standards for Feeding stuffs for Animals is given in Appendix 3.

Cost Structure

Raw materials account for the major cost item in the compound feed manufacturing industry in India. The estimated cost of processing per tonne of compound feed is given below:

1) Electricity : 50 Kwh/tonne	= Rs. 5.00
2) Steam: 120 lbs/tonne	= Rs. 1.00
3) Direct labour :	= Rs. 2.00
4) Depreciation on Capital	= Rs. 3.00
5) Interest on working capital (assumed at Rs. 10 lakhs)	= Rs. 3.00
Total	= Rs.17.00

The total product cost (inclusive of raw material costs) per tonne of compound feed is Rs. 600/- (approx.) Thus, the processing cost of the compound feed Industry accounts for only about 3 per cent of the total product cost (price). Raw materials account for the bulk of the total production costs.

Raw Materials
in Compound
Feeds Industry

The main raw materials used by the industry are oilcakes - mainly ground nut cake - both expeller and extraction, wheat and rice bran, broken wheat and rice, jowar, maize, molasses, fish and tapioca meal, maize gluten, vitamins, antibiotics, etc. The actual

proportion of the ingredients in different types of compound feeds depends on :

- (1) The nutrients required as per the feeding standards;
- (2) The availability of the ingredients; and
- (3) The price at which these ingredients are available.

Hence, there are wide variations in the actual composition of the feeds produced. On an average, however, the compound feeds for cattle manufactured in India contain 25 to 30% oilcakes or other sources of protein, 20 to 25% of cereals (such as maize, wheat, rice etc.), the balance is accounted for by various other inputs. The compound feed for poultry contains 35 to 45% cereals, and 20 to 25% of oilcakes or other proteinous materials.

Consumption of all kinds of raw materials by six units of the compound feed industry during 1963-64 and 1964-65 are shown in Table 7.

Protein in compound feeds is supplied mainly by oilcakes and fishmeal. In Europe and the U.S.A., this is to a large extent in the form of soyabean meal; in India, the major constituent is groundnut meal. In the U.K. and other countries, groundnut meal is at present

Table 7

Consumption of raw materials by 6 Compound Feed Manufacturing Units in India

Raw Materials	1963-64	1964-65	Percentage of each	
	Quantity (Metric tons)	Quantity	material used to total 1963-64	1964-65
1. <u>Oilcakes (total)</u>	6624	7064	35.46	34.97
Groundnut cake	3097	5396	19.53	19.32
Cottonseed cake	1496	3004	9.43	10.76
Kardi cake	27	8	0.17	0.03
Other oilcakes	1004	1356	6.33	4.86
2. <u>Other materials</u>	9239	20876	64.54	65.03
Wheat Bran	2421	4236	15.27	15.17
Rice Bran	1936	2794	9.68	10.01
Maize	1122	2967	7.07	10.63
Broken Wheat & Rice	1215	944	7.66	3.38
Molasses	1713	3227	10.80	11.56
Gram Chuni	340	360	2.14	1.29
Vitamins	3	211	0.02	0.76
Wheat Dust	16	205	0.10	0.73
Liver Residue	3	-	0.02	-
Mindif Minerals	2	11	0.01	0.04
Maize Bran	-	55	-	0.20
Gowar Meal	-	38	-	0.14
Suffer Mindif Minerals	-	12	-	0.04
Maize Gluten	-	10	-	0.04
Cottonseed	53	146	0.33	0.52
Cottonseed Husk	1802	2891	11.36	10.35
Tur Chuni	3	14	0.02	0.05
Sea Shell powder	10	22	0.06	0.08
Gums	-	16	-	0.06
Antibiotic	0.2	0.7	0.001	0.003
Fish Bone & Tapioca Meal etc.	n.a.	n.a.	(May be estimated to vary from 2% to 5%)	
Total	15863	27940	100.00	100.00

n.a. = Not available.

Source : Animal Feeds (Commodity Series No.5), Indian Institute of Foreign Trade; Appendix VI.

used mostly for cattle feed and to a limited extent in hog feeds. In the East European countries, groundnut meal is used for poultry feeds. In India, however, the compound feed manufacturers are using groundnut meal (both expeller and extraction) for poultry feed, upto 20% to 25%, in addition to sesame meal (5%). Sesame meal is used mainly due to its high sulfur amino acid and methionene content, and is used to supplement groundnut meal to satisfy the amino acid requirements of the feed.

The usual protein concentrates in cattle feeds in India are groundnut, cottonseed and other oilcakes. The main criterion for the use of the various oilcakes - groundnut, cottonseed, rapeseed cakes, etc. - is the economy or price of the constituents and not their individual amino acid components, since the ruminants have enough bacteria in their rumen to produce the necessary amino acids from any nitrogenous substance. It is, however, observed that cottonseed cake is preferred in the case of dairy cattle feeds since it results in a higher yield of milk with a higher fat content.

While both expeller and extracted cakes are being used by the compound feed manufacturers in India, excess

of fat contained therein (above the specifications as per ISI specifications) only raises the cost of the feed without increasing the energy value proportionately. The actual percentage consumption of the different types of expeller and extracted cakes in both cattle and poultry feeds by the units surveyed in India from 1964 to 1967 are given in Table 8.

The proportion of different oilseeds cake and meal used by the industry is, as mentioned earlier, bound to vary from year to year, depending on availability and price. Types of oilcakes and meals consumed by the nine units surveyed are given in Table 9.

The units surveyed were asked if they had any preference for expeller cakes (because of oil or fat content) over solvent extracted cakes. The response showed a mixed preference. Actual consumption of expeller and extracted cakes by these units does not show any consistent preference pattern. The reason for this may be (as reported by one unit) that preference depends not only on the availability and relative prices of these two types of oilcakes, but also of other materials containing fat like oilseeds and bran which are used by the manufacturers. One unit reports that

Table 8Percentage Utilisation of Oilcakes (type-wise) in Compound FeedsA. Cattle Feed

Year	<u>Groundnut</u>		<u>Cottonseed</u>		<u>Others</u>		Total of all cakes as percent of Production (feedwise)
	Ext.	Exp.	Ext.	Exp.	Ext.	Exp.	
1965	8.7	11.9	1.4	1.6	-	6.9	30.5
1966	12.4	6.7	1.0	1.3	1.6	4.5	27.5
1967	15.7	5.6	1.5	1.0	1.4	3.4	29.5

B. Poultry Feed:

	<u>Groundnut cake/meal</u>	<u>Sesame Cake/meal</u>	
1965	15.0	5.0	20.0
1966	15.3	5.3	20.3
1967	15.3	5.0	20.3

Note : Ext. Denotes extracted meal

Exp. Denotes expeller cake.

Table 9Consumption of Oilcake during 1961-67 by the nine units surveyed

(Tonnes)

Year	Groundnut	Cotton	Other cakes	Total
1961	353.0 (46.2)	381.0 (49.9)	30.0 (3.9)	764.0 (100.0)
1962	484.9 (61.3)	239.0 (30.2)	67.5 (8.5)	791.4 (100.0)
1963	738.1 (72.4)	191.0 (17.5)	110.0 (10.1)	1089.1 (100.0)
1964	2297.4 (66.2)	896.3 (25.8)	276.3 (8.0)	3470.0 (100.0)
1965	6599.8 (68.6)	1168.3 (12.1)	1849.0 (19.3)	9617.1 (100.0)
1966	9858.2 (71.8)	1196.0 (8.7)	2667.8 (19.5)	13722.0 (100.0)
1967	12277.2 (76.7)	1378.0 (8.6)	2360.0 (14.7)	16015.2 (100.0)

Note : Figures in brackets are percent of the total.

usage depends entirely on the relationship of price to nutritional value. The importance of the cost factor, i.e., the relative price of expeller cake and extractions taking into consideration their nutritive value can hardly be underestimated. Movements in prices of expeller cakes and extractions are not necessarily parallel. Two units have emphasised the need to have a mixture of expeller and extracted cakes. One of these uses a mixture of the two in order to achieve the minimum level of fat content and to improve palatability. The other reports that oilcakes are used to maintain fatty contents for a balanced cattle feed.

Marketing:

The entire output of the compound feed industry is, at present, being marketed within the country. The two methods of selling are direct sales to individual users as well as institutional consumers, and sales through established selling agents. One of the most difficult problems that the industry is facing in selling its product in the domestic market, is that of convincing the farmer and others of the advantages in the use of compound feeds vis-a-vis other conventional feeds. This is especially true in the case of cattlefeeds.

India is not exporting any significant quantity of compound feeds. One of the units sent a small consignment of two tonnes to one of the countries in Middle East in 1964-65. One other unit reported that it exports occasionally. Another unit reported that, on an average, it exports about ten tonnes per year.

The survey conducted by the Indian Institute of Foreign Trade^{8/} showed that six of the eleven units surveyed by them reported having received enquiries from Malayasia, Singapore, Hong Kong, Ceylon, Japan and some Middle East countries. Three of the units had reported that they were actively exploring the possibilities of exporting compound feeds.

Prices of Compound Feed

The selling price of compound feeds produced in India generally ranges from Rs. 500 - 600 per tonne for cattle feeds and Rs. 600 - 700 per tonne for poultry feeds. It has not been possible to obtain actual prices of compound feeds in foreign countries, except for Canada. The unit values of feed exports from some countries, wholesale prices of feeds sold in Canada and the ex-factory prices of feeds produced in the U.K. are shown

^{8/} Animal feeds (Commodity series No.5) Indian Institute of Foreign Trade, New Delhi.

in Appendices 4, 5 and 6. The wholesale prices for mixed feeds in Canada range from \$ 50 to \$ 90 per ton for cattle feeds and \$ 60 to \$155 per ton for poultry feeds. The ex-factory (London) prices of compound feeds produced in the U.K. varied from £ 32 to £ 38 per ton for cattle feeds and £ 33 to £ 44 for poultry feeds.

The large variations in the composition of different feeds due to specifications which vary from country to country, rendered unit value comparisons meaningless. We have, therefore, not attempted these.

Expansion Plans in the Compound Feed Industry

The five out of the nine units surveyed are reported to have plans for expansion in the near future.

Although different units have different plans of expansion, there seems to be a consensus of opinion on the prospects for rapid expansion in the next few years. Once a breakthrough in acceptance of mixed feed for cattle occurs the scope is indeed large. But the development of poultry and eggs production on a large-scale basis (which has already set in) is likely to provide a larger impetus in a shorter period of time. The very organisation of the industry is such that large-scale utilisation of compound poultry feed is easily accepted.

Utilisation of available excess capacity and the expansion plans imply additional requirements of raw materials including oilcakes by this industry. Consumption of oilcakes during 1967 by the surveyed units show that oilcakes account for 32.6 per cent of the total production of compound feeds. Assuming this proportion for earlier years the consumption of oilcakes by the industry as a whole during 1964-67 may be estimated as follows :

<u>Year</u>	<u>Production of mixed feeds</u>	<u>Consumption of Oilcakes('000 tons)</u>
1964	39.8	13.0
1965	80.6	23.3
1966	111.2	36.2
1967	153.0	49.9

Of the total consumption of oilcakes, about 75% was accounted for by groundnut cake and meal, about 10% by cottonseed cakes and the rest by 'others'.

Export Prospects

The Indian Institute of Foreign Trade which prepared a commodity study report on "Animal Feeds" in 1966 has concluded that there appears to be scope for exporting compound cattle feeds and poultry concentrants

from India! On the basis of the available spare capacity it is estimated that India is in a position to export one to two lakh tonnes of compound feeds per year valued at Rs. 5 to Rs. 10 crores.^{9/} The study admits that India is not presently exporting compound feeds but adds, "while the general concensus among the manufacturers and other knowledgeable persons have been that India can export Compound Animal Feeds, it was felt that this would be possible only if concerted measures are undertaken in conducting market studies, allotting quotas of the scarce materials to the industry and meeting the losses which might be involved in exports".^{10/} The Institute itself feels that "there is scope for exporting Compound feeds from India, especially in view of the fact that India is a source of so many raw materials which other countries have to import".^{11/}

The past export performance of the compound feed manufacturers in India and the existing pattern of the world trade in compound feeds outlined earlier, however, do not lend much support to the exuberance displayed by

^{9/} Animal Feeds, op.cit

^{10/} Ibid, p. 41.

^{11/} Ibid, p. 42.

the Indian Institute of Foreign Trade on the export prospects in compound feeds. The factors limiting the world trade in compound feeds are still strong. In fact, to prevent health hazards - to both animals and human beings - not only more and more countries would regulate sales of compound feeds within their national boundaries, but most countries, already regulating such sales, would further strengthen their regulations to ensure best quality products for their live-stock and human population. True, the U.S. exports of poultry feeds have almost doubled during the last decade. But the United States has a distinct advantage in this sector of mixed feeds, as many countries import the U.D. breeds of chicks and broilers, and, therefore, prefer appropriate mixed feeds manufactured for such breeds in the United States. Incidentally, it would be pertinent to observe that even the U.S. exports of all dairy feeds are just little over 20,000 tonnes a year.

The I.I.F.T. study is, of course, aware that it is difficult for India to export compound feeds to countries such as the U.K. and other West European nations which have highly developed compound feed manufacturing industries. The study therefore recommends that India

should try to market its compound feeds to the Middle East countries, and also Malayasia, Singapore and Hong Kong. While we do not dispute that the Middle East and the South East Asian regions (and even perhaps Japan) may present good outlets for Indian compound feeds, we think it would be a serious mistake to overstate the importance of these markets. As it is, there are no large cattle populations in many of the countries in these regions. Moreover, apart from the availability of pasture land, the factors which inhibit the growth of large-scale utilisation of compound feeds for cattle in India - such as, low per capita income and consequently low per capita meat and milk consumption, small size of the organised dairy industry, ignorance and poverty of farmers etc. - operate equally strongly in most of these countries. True, the poultry sector may possibly expand in many of them. But the difficulties in market development for Indian poultry feeds are also many. First, groundnut meal which is used by the Indian compound feed industry in poultry feeds is by no means the most satisfactory protein source for such feeds. Most countries in Western Europe and North America have already replaced groundnut cakes by soyabean meals in poultry rations, because of the superior nutritive value

of the latter. Secondly, many countries in these regions like Lebanon, Hong Kong, Singapore etc. are importing U.S. poultry feeds. It would be difficult for India to dislodge the U.S. from these markets, especially when the feeds manufactured by the latter are more nutritious, palatable and digestible. Thirdly, the prices of cereals and their by-products which constitute 35 to 45 per cent of the raw material components in poultry feeds, are high in India relative to their international market prices. And so also are prices of other components like vitamins, minerals, antibiotics, etc. These high raw material prices would obviously render Indian poultry feeds less competitive in price in the Middle East and S.E. Asia vis-a-vis similar feeds from other exporting countries. Lastly, it cannot be denied that very little is as yet known about these markets and their precise import potential for compound feeds.

We do not wish to exaggerate the problems of export marketing in compound feeds. At the same time, we wish it to be clearly recognised that the problems are so complex that the prospects for exports of compound feeds from India in the near future are none-too-promising. Nevertheless, we would emphasise that concerted efforts

should be made by both the Government and the industry to overcome the various difficulties so that India could participate, albeit in a modest way, in the world trade in compound feeds. We have, therefore, little hesitation in commending the various recommendations made by the Indian Institute of Foreign Trade in its study on "Animal Feeds". As a first step in implementing these recommendations, we would suggest that market studies in compound feeds may immediately be initiated in Malayasia, Singapore, Hong Kong, Japan, the Middle East countries and even Eastern Europe.

The East European countries, it may be recalled have a large market potential for compound feeds for poultry, cattle and hogs. The demand for dairy and meat products in these countries is rising rapidly. Their mixed feed industry, on the other hand, has been established only recently and is not yet highly developed. The East European countries presently import substantial quantities of Indian oilcakes and meal for use in their compound feed industry. These countries, therefore, would not be averse to the import of whole compound feeds from India. We would suggest that compound feeds may be included in the lists of commodities specified for trade

with these countries. Perhaps, the Government may also explore the possibility of establishing new compound feed manufacturing units in India in direct technical collaboration with the appropriate State organisations of the East European Governments, under condition that the entire or substantial part of the production of such units shall be exported. If such collaborations materialise, a new vista would be opened for India's export trade in animal feedstuffs.

APPENDIX 1

List of members of the Cattle Feed manufacture
Association of India

1. Bhandari Crosfields (Pvt.) Ltd.,
27, Mahatma Gandhi Road,
Indore City.
2. Brahmappa Tavanappanavar Pvt. Ltd.,
Post Box No.7,
Davangere (Mysore State)
3. East Asiatic Co. (India) Pvt.Ltd.,
Mercantile Bank Building,
16, First Line Beach,
Post Box No. 146,
Madras.
4. Foods, Fats & Fertilizers Pvt.Ltd.,
'Goenka Chambers',
115-B, N.S.C.Bose Road,
Bombay - 1.
5. Hindustan Lever Ltd.,
Hindustan Lever House,
165/166 Backbay Reclamation,
Bombay - 1.
6. Hindustan Feed Products,
Mohatta Market,
1st Floor, Room No.15,
Palton Road, Bombay -1.
7. Kaira District Co-operative
Milk Producers' Union Ltd.,
Anand (Gujarat State).

8. Karnatak Cattle & Poultry Feeds,
Usabinagatti Street,
Gadag (Dist: Dharwar)
Mysore State.
9. Mysore Feeds Pvt. Ltd.,
230, Old Tharagupet,
Bangalore - 2.
10. Nandi Provender Mills,
33, Najafgarh Industrial Area,
New Delhi - 15.
11. Savaldas Madhavadas,
17/101, Oppanakara Street,
P.O.Box. No. 198,
Coimbatore - 1.
12. Shah Chemical & Fertiliser Pvt. Ltd.,
1875, Dhan - Nivas,
Krishnanagar,
Bhavanagar - 2.
13. Shaw Wallace & Co.Ltd.,
8.9, Thambu Chetty Street,
Post Box. No. 14,
Madras - 1.
14. Sundatta Foods & Fibres Ltd.,
Karwar Road,
Post Box No. 27,
Hubli. (Mysore State)
15. Tata Oil Mills Co.Ltd.,
'Bombay House',
Bruce Street,
Bombay - 1.

16. East Coast Flour Mills Pvt. Ltd.,
1/11, Asaf Ali Road,
Pahwa Mansion,
New Delhi - 1.
17. Jannadas Madhavaji,
Tama House,
11-A, Wodehouse Road,
Bombay - 1.
18. Jay Em Provender Mills,
54/A, Nayaganj,
Kanpur.
19. Paramount Cattle Feed Co.,
Ramdayal Chasiram Oil Mills,
Chandrayangutta,
Hyderabad - 5.

APPENDIX - 2The Use of Oilcakes in the Cattle/Poultry
feed Industry in IndiaQuestionnaire

1. Name of the concern: _____
2. Location: _____
3. Year of starting of production: _____
4. Plant & Machinery supplier: _____
(Please mention the organisa-
tion with complete postal
address) _____
5. Approximate installed cost of
the plant & machinery : _____
(Please indicate foreign ex-
change requirements, if any)
6. Products manufactured: a) Cattle feed ☐
b) Poultry feed ☐
c) Others (specify) _____

7. Installed capacity and production:

Installed capacity 1967 (Unit _____)

Production Unit (Unit _____)

Cattle feed

Poultry feed

Others

1961	1962	1963	1964	1965	1966	1967

8. Do you have plans for expansion? Yes ☐ No ☐

If 'yes', please indicate your plans: _____

9. Is oilcake available in your state? Yes ☐ No ☐

Do you procure oilcakes from

Your state ☐ Other States ☐ Both ☐

10. What are your average annual consumption of oilcakes? Please mention under 'E' the quantity of Expeller cake and under 'S' the quantity of Solvent Extracted cake:

(Unit _____)

	1961	1962	1963	1964	1965	1966	1967
a) <u>For Cattle Feed</u>							
i) Groundnut	E						
	S						
ii) Linseed	E						
	S						
iii) Sesame	E						
	S						
iv) Rape/Mustard	E						
	S						
v) Cottonseed	E						
	S						
vi) Others (specify)	E						
	S						

b) For Poultry Feed

i) Groundnut	E						
	S						
ii) Linseed	E						
	S						
iii) Sesame	E						
	S						
iv) Rape/Mustard	E						
	S						
v) Cottonseed	E						
	S						
vi) Others (specify)	E						
	S						

Contd.....

11. What is the average analysis of oilcakes that you insist upon while purchasing the cakes?

	Oil %	Protein value %	Mois- ture%	Fibre %	FFA %	Gossy- pol %	Other toxic ingre- dients %
a) <u>For Cattle feed</u>							
i) Groundnut							
ii) Linseed							
iii) Sesame							
iv) Rape/Mustard							
v) Cottonseed							
vi) Others (specify)							
b) <u>For Poultry Feed</u>							
i) Groundnut							
ii) Linseed							
iii) Sesame							
iv) Rape/Mustard							
v) Cottonseed							
vi) Others (Specify)							

12. Do you follow any Indian Standards (IS) specification for the oilcake and the final product?

Yes

☐

No

☐

If 'yes', please mention the ISI specification number _____

13. How do you control the toxic ingredients like Gossypol, Aflatoxin etc. in the product? _____

Contd.....

14. Do you have any preference for Expeller oilcakes over Solvent Extracted oilcakes?

Yes ☐No ☐

If 'yes', why? _____

15. Have you at any time observed any deterioration in the quality of oilcake on standing?

Yes ☐No ☐

If 'yes', what steps were taken to prevent such deterioration?

16. Have you at any time received complaints against your products, which you feel can be attributed to oilcakes?

Yes ☐No ☐

If 'yes' please give an account of the same _____

17. Do you export any of your products?

Yes ☐No ☐

If 'yes', please give the following details:

Contd.....

* Country to
which exported

Quantity exported (Unit _____)

	1963	1964	1965	1966	1967
i)					
ii)					
iii)					
iv)					
v)					
vi)					

* If you are exporting to a large number of countries, please mention the major importing countries.

18. Any other information you think relevant to the use of oilcakes in your industry _____

Appendix - 3

List of Indian Standard for Feeding Stuffs for Animals
(upto August, 1965)

IS :	1374 - 1964	Specification for Poultry Feeds (Revised)
IS :	1509 - 1959	Specification for Tapioca Chips for Animal Feed
IS :	1510 - 1959	Specification for Tapioca Flour for Animal Feed
IS :	1664 - 1960	Specification for Mineral Mixture for Supplementing Cattle Feeds.
IS :	1712 - 1960	Specification for cottonseed Oilcake as livestock Feed.
IS :	1713 - 1960	Specification for Decorticated Groundnut Oilcake as Livestock Feed.
IS :	1714 - 1960	Methods of Sampling and Test for Oilcakes as Livestock Feed.
IS :	1932 - 1961	Specification for Mustard and Rape Oilcake as Livestock Feed.
IS :	1934 - 1961	Specification for Sesamum (Til) Oilcake as Livestock Feed.
IS :	1935 - 1961	Specification for Linseed Oilcake as Livestock Feed.
IS :	1942 - 1961	Specification for Bone-Meal as Livestock Feed.
IS :	2052 - 1961	Specification for Balanced Feed Mixtures for Cattle.

IS :	2151 - 1962	Specification for Maize Germ Oilcake
IS :	2152 - 1962	Specification for Maize Gluten Feed
IS :	2153 - 1962	Specification for Maize Bran
IS :	2154 - 1962	Specification for Coconut Oilcake as Livestock Feed
IS :	2239 - 1962	Specification for Wheat Bran
IS :	2503 - 1963	Specification for Decorticated Safflower (Kardi) Oilcake as Livestock Feed.

Source : The Indian Standards Institute.

Appendix 4United Values of Compound Feed exported from selected countries

	<u>£'s per metric ton</u>	
	<u>1963</u>	<u>1964</u>
I. <u>U.S.A.</u>		
1) Poultry Feeds prepared or mixed	39.5	40.5
2) Wheat feeds - prepared or mixed	22.4	22.9
3) Dairy feeds - prepared or mixed	-	41.6
4) Corn feeds - prepared or mixed	221.3	20.9
II. <u>U.K.</u>	<u>1961</u>	<u>1963</u>
"Feeding stuffs for animals	37.1	37.8
III. <u>Australia</u>	<u>1962-63</u>	<u>1963-66</u>
"Prepared Mixed Stock feeds	37.5	30.7
IV. <u>New Zealand</u>	<u>1960</u>	<u>1961</u>
"Poultry mash"	34.6	34.01
V. <u>Belgium</u>	<u>1963</u>	<u>1964</u>
"Compound Feeding Stuffs"	40.2	47.7

Note : Computed from Export Statistics of the respective countries.

Source : Animal Feeds: Indian Institute of Foreign Trade;
Appendix IX.

Appendix 5Wholesale Prices of Canadian Animal Feeds

<u>I t e m</u>	<u>Wholesale Prices in 1964 per ton</u>	<u>Protein Contents</u>
<u>I. Complete Feeds</u>		
Cattle Feeds	50 - 90	13 - 32%
Pig Feeds	55 - 125	13 - 38%
Poultry Feeds	60 - 155	14 - 45%
<u>I t e m</u>	<u>Wholesale prices in 1964 per 1001 lbs.</u>	<u>Protein Content</u>
<u>II. High Protein Feeds</u>		
Rapeseed meal	60	40%
Linseed Meal	78	36%
Soyabean meal	85	44%
Sunflower seed meal	90	50%

Note: Data supplied by the High Commission of India, Ottawa.

Source : Animal Feeds : Indian Institute of Foreign Trade;
Appendix IX, B.

Appendix 6

Quantity and Value and ex-mill Price of Compound Feeds produced
in the United Kingdom

Type of Feed	1959-60		
	Qty (000 tons.)	Value (£ million)	Value (per ton £)
1. Cattle	2734	88.4	32.1
2. Calf	325	14.9	46.1
3. Pig	1772	56.1	31.6
4. Poultry	3523	116.6	33.2
5. Horse and owe	69	2.3	28.9
6. Others	50	1.3	20.0
Total	8473	279.6	33.0

Source : "Developments in Feeding Stuffs Manufacturing Industry"
U.K., Ministry of Agriculture, Fisheries and Food,
Economic Trends (U.K.) August, 1964

(Contd.)

Appendix 6 (Contd.)

Type of Feed	1961-62		
	Qty. (000 tons)	Value (£ million)	Value (per ton £)
1. Cattle	2844	90.5	31.9
2. Calf	311	13.4	41.8
3. Pig	1956	61.3	31.2
4. Poultry	3951	127.6	32.3
5. Horse and owe	91	2.9	32.9
6. Others	83	1.5	31.8
Total	9219	297.2	32.2

(Contd.)

Appendix 6 (Contd.)

Type of Feed	1962-63		
	Qty. (000 tons)	Value (£ million)	Value (per ton £)
1. Cattle	2820	93.1	32.9
2. Calf	365	15.9	43.8
3. Pig	2168	70.3	32.2
4. Poultry	3828	129.1	33.7
5. Horse and owe	115	3.8	34.7
6. Others	26	0.9	38.4
Total	9322	313.1	33.5

C O U N T R Y R E P O R T S

COUNTRY REPORTS

1. United Kingdom

The United Kingdom is the world's third largest oilcake importing country following West Germany and Japan. Except for an inconsiderable amount of rapeseed produced domestically, the U.K. is entirely dependent on imports for her requirements of high protein oilcakes and vegetable oils. From India's export point of view, the U.K. has been the only large market for her oilcakes in the free currency area. The need to hold this position and regain losses in this market where she has particular advantages requires a detailed analysis of this market.

Table 1: UNITED KINGDOM: IMPORTS OF OILSEEDS, OILCAKES AND FISHMEAL

('000 metric tons)

	1960	1964	1967
(1) Imports of Oilseeds	1069	935.7	680
(2) Cake equivalent of (1)	640	565	426
(3) Imports of Oilcakes	1238	1000	1015
(4) Total oilcake imports (2)+(3)	1878	1565	1441
(5) Imports of Fishmeal	169	282	394

Source: Supply-Distribution - U.K.

Over the past seven years imports of high protein oilcakes including cake equivalent of oilseed have declined by slightly over 23 percent (Table 1 above). The fall in British imports has been more in the case of seed imports - a decline of almost 40 percent - than in oilcakes as such, where the decline was 18 percent. Imports of fishmeal, on the otherhand, has been able to make rapid gains, the increase being 133 percent over the seven year period 1960 to 1967.

Production
of Oilcakes
in the U.K.

The decline in production of oilcakes in the U.K. has set in over a fairly long period of time. Britain has found it increasingly economical to import her cake and oil requirements rather than undertake the imports of seeds for processing. Crushing costs are too high as compared to imports. The domestic crusher, even with a high degree of protection against non-Commonwealth imports, is unable to ensure a reasonable crushing margin. The result has been a decline in crushing capacity. Every year mills go out of business. In the course of our market survey we were given to understand that 2-3 mills would close down this year. There are less than a dozen major crushing firms at present and generally work to much below capacity levels, at present less than 50 percent of rated capacity is utilised.

Table 2: U.K.: COMPOSITION AND STRUCTURE OF OILCAKE AND MEAL PRODUCTION

('000 metric tons)

	<u>1960</u>	<u>1964</u>	<u>1967</u>
Groundnut	72 (11.3)	82 (14.5)	56 (13.1)
Soyabean	252 (39.4)	233 (41.2)	200 (40.8)
Cottonseed	58 (9.1)	48 (8.5)	21 (4.9)
Rapeseed/Mustard	2 (0.4)	7 (1.2)	22 (5.1)
Linseed	103 (16.1)	74 (13.9)	61 (14.3)
Palm Kernel	125 (19.5)	101 (17.9)	51 (11.9)
Copra	27 (4.2)	20 (2.8)	15 (3.9)
Total	640 (100.0)	565 (100.0)	427 (100.0)

(Figures in brackets are % of total)

Source: Supply-Distribution Tables - U.K.

This decline in the crushing of oilseeds has occurred in all oilseeds except rapeseed and mustard. The gains in the share of soya have been offset by the sharp decline in palm kernel. Except for a small quantity of soya almost all other oilseed imports in the U.K. originate from the Commonwealth group of countries. That soya could maintain an increasing share in a sharply falling market is clearly indicative of a shift due to external factors, namely a cut in the exportable surplus of seeds in the U.K.'s Commonwealth partner countries. Some of the mills have, in fact, adjusted their production techniques to soya crushing.

The U.K. crushing industry is protected against imports of vegetable oils and cake. Soyabean imports from non-Commonwealth countries had to bear an ad valorem import duty of 5 percent. This has been removed with effect from 1st July 1967. However, it may be noted that prior to this tariff abolition, most of U.K. soyabean imports were from Canada and hence no duty was levied. The declining trend in the industry is, therefore, likely to continue. The U.K. also imposes a duty of 15 percent ad valorem on imports of soyabean oil from non-Commonwealth countries, no concessions on this commodity emerged from the Kennedy Round of Tariff Negotiations. The U.K. also levied

a duty of 15 percent ad-valorem on the imports of soyabean meal and a 10 percent ad-valorem duty on other oilcakes from non-Commonwealth countries. In the Kennedy Round of Tariff Negotiations, these were reduced in the case of soyabean meal to 13 percent effective on 1st July, 1967, to be gradually brought down to 10 percent by 1st January, 1972. No tariff concessions were made on other cakes and meal in view of the opposition from Britain's Commonwealth partners.

Lengthy discussions with the various interests gave us to understand that the net impact of these tariff negotiations are unlikely to benefit the crushing industry. They expected that there would be only a very limited crush of oilseeds in Britain by 1975, the industry would be largely dismantled or shifted to other countries in seed producing areas. The basic comparative cost disadvantages makes this process inevitable.

Imports of
Oilcakes
in the U.K.

As observed in Table 1, U.K. imports of oilcakes in the form of oilseeds received a sharp set-back between 1960 and 1967 - a decline of 33 percent.

Table 3: U.K. IMPORTS OF OILCAKES BY TYPE

('000 metric tons)						
(Index 1960 = 100)						
Type of cake and Meal	1960	% of total	1964	% of total	1967	% of total
Groundnut	552	(44.6)	493	(49.3)	337	(33.3)
Index	100.0		89.3		61.1	
Soyabean	219	(17.8)	193	(19.3)	164	(16.2)
Index	100.0		88.1		74.8	
Cottonseed	251	(20.3)	172	(17.2)	205	(20.2)
Index	100.0		68.5		81.7	
Sunflower seed	100	(8.1)	60	(6.0)	133	(13.1)
Index	100.0		60.0		133.0	
Linseed	50.0	(4.0)	20	(2.0)	8	(7.1)
Index	100.0		40.0		16.0	
Others	65	(5.2)	62	(6.2)	104	(10.2)
Index	100.0		95.4		160.0	
Total	1238	(100.0)	1000	(100.0)	1015	(100.0)
Index	100.0		80.8		82.0	

(Figures in brackets are % of share of total)

Source: Supply-Distribution Tables - U.K.

Imports of oilcakes as such also declined, but by a relatively lower proportion - 18 percent. Table 3 below shows the trends in imports by types of oilcakes only.

Except for sunflowerseed cake and the category 'others', Britain's imports of all other oilcakes declined. Linseed cake imports received the severest setback imports of this product into Britain declined to insignificant levels. Imports of Groundnut cake, which in early 1960's accounted for almost half of Britain's total oilcake imports suffered the largest decline in absolute terms. However, they still account for a third of total oilcake imports. It will be observed that soyabean meal imports declined to 3/4ths of their 1960 level, but maintained a more or less stable share of the British market.

The overall trends in the U.K. imports of oilcakes (including cake equivalent of seeds) have partly been offset by a sharp increase in imports of fishmeal. Britain does not re-export either oilseeds or cake, hence these trends in imports are reflected pari passu in consumption of high protein meals and cake.

Table 4: U.K.: APPARENT CONSUMPTION OF OILSEED CAKES AND MEAL INCLUDING FISHMEAL

('000 metric tons)

	1960	% of total	1964	% of total	1967	% of total
Groundnut	624	(30.5)	575	(29.8)	394	(21.5)
Soyabean	471*	(23.0)	425	(22.0)	363*	(19.8)
Cottonseed	310	(15.1)	220	(11.4)	226	(12.3)
Sunflowerseed	100	(4.9)	60	(3.1)	133	(7.3)
Linseed	153	(7.5)	94	(4.9)	69	(3.8)
Rapeseed & Mustard+	2	(0.1)	7	(0.4)	85	(2.8)
Palm Kernel	125	(6.1)	101	(5.2)	51	(2.8)
Copra	27	(1.3)	20	(1.0)	15	(0.8)
Others	65	(3.2)	63	(3.3)	104	(5.7)
Fishmeal	169	(8.3)	367	(18.9)	394	(21.4)
Total	2046	(100.0)	1932	(100.0)	1834	(100.0)

(figures in brackets are % of total)

Source: Supply-Distribution Tables U.K.

* + Please see next page

- * The net availability of soyabean meal in the U.K. during 1967 was sharply marked down as compared to the 1965-66 average of 457,000 metric tons.
- + Imports of rapeseed and mustard cake were negligible except during 1966 and 1967.

The overall consumption of cake and meal in the U.K. has clearly trended downward. The only net gainers have been fish-meal, sunflower and rape/mustard oilcakes over the 1960-67 period. However, if one examines the protein composition of these different types of cake and meal imported and consumed in the U.K. one gets a clear picture of demand tending to stagnate on a plateau (see Supply-Distribution Tables U.K.). The decline over 1966 and 1967 is to be considered in the light of particular factors operating in the U.K. economy as a whole, namely the balance of payments problem and the credit squeeze on the one hand and the relatively favourable grain crops situation on the other.

This stagnation is again evident in the production of compound feeds.

Production of
Mixed
Feeds

The U.K. has been able to develop the world's second largest compound feed manufacturing industry (the U.S. being the largest). This position has only recently been challenged by Japan, where against Britain's more or less stable output during 1962-67 Japan has continued to maintain a consistent and high rate of growth.

Table 5: U.K.: PRODUCTION OF COMPOUND FEEDINGSTUFFS -
GROWTH AND STRUCTURE

('000 metric tons)

(Index 1960 = 100)

Type of Feed	1960	% of total	1964	% of total	1967	% of total
Cattle & Calf Food	3168	(36.1)	3134	(33.1)	3536	(36.1)
Index	100.0		98.9		111.6	
Pigs Food	1792	(20.4)	2075	(21.9)	1972	(20.1)
Index	100.0		115.8		110.0	
Poultry Food	3669	(41.8)	4088	(43.2)	4107	(42.0)
Index	100.0		111.4		111.9	
Others	155	(1.7)	169	(1.8)	174	(1.8)
Index	100.0		109.0		112.3	
Total	8784	(100.0)	9466	(100.0)	9789	(100.0)
Index	100.0		107.8		111.4	

(figures in brackets are % of total)

Source: Ministry of Agriculture, Fisheries & Food, Statistics 1, Branch B, Whitehall Place, S.N.1.

The production of compound feed in the U.K. is an important indicator of the trends in high protein cake and meal demand. Techniques of livestock and poultry feeding have reached a high level of sophistication. Whilst some large livestock producing farmers mix their own feed, concentrates are invariably bought. Very little oilcake is fed directly. In the U.K. as in the Netherlands and Belgium, manufactured feeds represent a very high percentage of feed fed to livestock. Production of these increased on an average by a mere 1.6 percent per annum. Trends in individual types of compound feeds produced show a very high degree of stability. It is to be noted that there are hundreds of types of compound mixed feeds produced by the large manufacturers.

The compound feed manufacturing industry in the U.K. is literally spread over hundreds of small compounders dispersed all over the country. At present there are about 900 compound feed manufacturers; production, however, is concentrated in the hands of 15-20 large producers in port towns like London, Bristol, Glasgow etc. The British Oil and Cake Mills, Ltd. with several factories, all in port towns, and the Associated Feed Manufacturers, Ltd., both belonging

to the Unilever group, account for over 1/3 of total British output of this product. In the face of falling production, the low margins (competition has watered these down very considerably during the 1960's), the industry has tended to become concentrated through mergers, amalgamations and overall reorganisation.

An important and interesting feature has been the competition between mills located at port (or deep-water mills) and those located in the country. Each location has its own advantages (as in the case of crushing) and disadvantages. The port mills exploit scale economies, automation and proximity of imports; the country mills have distribution advantages and proximity of home grown cereals. With government encouragement of field beans, increasing supplies of vegetable protein are likely to become available near at hand. It is significant, that with the increased domestic production of barley, the country mills have made a bigger headway than the port mills. Even though port mills still account for 64 percent of output, in the last five years their production has consistently declined by about 360,000 tons per annum

(i.e. an annual fall of 6.4 percent) as against a growth of 315,000 tons (11.6 percent) in the output of country mills. It is this relative growth in output and the importance of ingredients in each type that explains the fall in imports of high protein oilcake meal against a steadily expanding output of compound feeds.

Factors
Affecting
Consump-
tion of
Oilcakes
and Meals

As mentioned earlier, the United Kingdom has developed very sophisticated techniques of feeding livestock. Almost all feeding is in the form of balanced rations, breeding techniques have achieved high standards and feed-conversion ratios are at an optimum. In these circumstances, the growth in overall high protein feed consumption is directly related to growth in livestock production. (Some specialists in this field visualise a small decline in the proportion of high protein oilcake and meal per unit of compound feeds). Very little of oilcakes is used as direct cattlefeed, this was estimated at less than 10 percent by many of the traders and compound feed manufacturers.

Another factor that has tended to damp the growth in oilcakes consumption is the high proportion of fishmeal that is used for poultry and hogs. It must be remembered that

fishmeal is a relatively high protein content feedstuff. The price advantage that this commodity had till recently over oilcakes since 1960, is evident from the fact that imports of fishmeal have to bear an import duty of 10 percent ad-valorem (which remained unchanged at the Kennedy Round of Tariff Negotiations). In 1960, of the total estimated protein net availability for consumption in U.K., fishmeal accounted for 12.2 percent, by 1967 this share rose to 30.3 percent.

The United Kingdom, unlike some European countries has large resources of pasture land. Secondly, prices of grains like barley, oats and maize are relatively lower (see country-report, West Germany - Annexure IV : Prices of Feed Grains). Grains are, therefore, more extensively used than, say, in Germany, France and Italy. As pointed out earlier, increased production of barley clearly influenced the country mills production of mixed feeds as against port mills. It also influenced the farmer who mixes his own rations - home grown produce with concentrates of protein/mineral/vitamin/antibiotics, etc. produced by the compounder. Keeping this fact in mind, the compound feed

manufacturing industry is increasingly adopting itself to emerging trends.

These observations lead to one important conclusion namely, no large increases in consumption of high protein oilcakes in the U.K. need be expected. There is no doubt that the inroads made by fishmeal cannot continue further, (the basic limitation in the proportion in which this product can be used in compound feeds). Increased demand for oilcakes will necessarily be a function of increased livestock production. This is, in fact, what has happened over the past several years.

Livestock
and
Poultry

Meat and egg consumption per capita in the U.K. are way below levels in the U.S.A. and Canada. In the case of beef and poultry, consumption levels compare favourably with those of the EEC and other West European countries. The U.K., except in the case of poultry, is still dependant to a large extent on imports for her requirements of meat and dairy products. Over the 1960's per capita meat consumption shows no consistent trend, except in the case of poultry. Two factors need to be considered for prospective demand and production of livestock, poultry and dairy products, (1) the efforts that the U.K. will make in order to lower the level of import dependence on meat and dairy products and (2) the rise in per capita consumption of these products.

Efforts are being made to increase the production of meat and dairy products through the system of guaranteed prices. The fall in production of livestock products - especially pigs last year - has induced the Government to provide various incentives for an expansion in livestock production.

Annexure Tables I and II give the trends in production of livestock, poultry and eggs. Total high protein consuming animal units in the U.K. increased by 17.4 percent over the 1960 to 1967 period. As in most European countries poultry was able to record the highest rate of growth. This is largely the influence of the development of the broiler industry. Whilst cattle numbers increased the least, production of pigs was relatively large. Beef production in the U.K. is still of a very limited order, the same livestock produce price policy as in the EEC makes dairy production profitable relative to beef production. Higher guarantee prices for beef would tend to encourage its production.

The U.K. National Plan for 1970, envisages substantial increase in the production of livestock. The estimated increases over 1964, were 420,000 more dairy cows,

160,000 more cows and 12 million more poultry. These in terms of percentage increase over 1964 were 3.6 percent, 21.7 and 44.1 percent respectively. Compared to the performance over 1960 and 1966, these targets appear ambitious. Nonetheless the scope of these materialising is believed to be favourable considering that "it must take time before financial incentives to expand livestock production are translated into increased livestock numbers on farms, particularly following a period when producers' confidence in the future has been shaken"*.

Annexure Table III shows the trends in the apparent high protein oilcake and meal consumption per animal unit in the U.K. over the 1960 to 1967 period. Apart from small fluctuations, there has been a clear downward trend in per animal unit consumption. The reason for this has already been explained above. It also verifies the opinion of experts in the compound feed manufacturing industry, that feed-conversion ratios are improving on the one hand and that the proportion of high protein oilcakes and meal in mixed feeds has reached optimum levels. It is difficult to visualise the extent to which high protein oilcake and meal consumed per animal unit will further decline, if at all it does.

* Prospects for the Feed Milling Industry : Desmond Bird, CAFMA Press Abstracts; July 1967, London.

The FAO projections of livestock, poultry and eggs production visualise the following growth rates:

Product	Annual Average growth rate	Cumulative 8 years 1967-75
Beef & Veal	1.86	14.9
Pork	2.55	20.4
Poultry	2.66	21.3
Eggs	1.53	12.3

Computed from: FAO Agricultural Commodities
Projection - op.cit.

Applying these growth rates to high protein consuming animal units, we get Britain's consumption requirements of high protein oilcake (44% protein content cake) as being 2.5 million tons for 1975. Availability for consumption (which in the case of the U.K. is the same as import requirements) in 1967 was 1,990,000 tons. Imports of oilcakes would therefore, increase by 25.0 percent only over the 1967-75 period.

Conclusion:

Assuming that more intensive programmes, by way of incentives, do materialise in a higher rate of growth in livestock and dairy products and that the National Plan

Programmes for 1970 are continued, demand for oilcakes may increase at a faster rate. But given the techniques of feeding in Britain and the increased production and utilisation of home grown vegetable proteins (discussed earlier) the increase is not likely to be of a much higher order. One could, therefore, estimate an expansion of 25 percent in the demand for oilcake and meal over the 1967-75 period or an annual growth rate of 3.0 percent. If, however, this growth is combined with the fall in production of oilcakes from imported oilseed, the average growth in meal imports would be higher.

Summing-up:

Imports of oilcake and meal (including cake equivalent of oilseeds and fishmeal) in the U.K. recorded a downtrend over the 1960-67 period. Feeding techniques have reached a high level of technical efficiency resulting in a decline in the per animal unit consumption of high protein materials. Two favourable factors, however, are likely to increase the import level of oilcakes. Firstly, the decline in the oilseeds processing industry's capacity and secondly, the growth in production of meat and dairy products visualised by the U.K. National Plan Programmes will result in increased oilcake imports.

The Commonwealth Preference system confers a special advantage to India in this market. Efforts, therefore, can be successfully made to increase India's share in the U.K. imports of high protein animal feedstuffs.

Annexure Table 1

United Kingdom

Cattle and Hogs on Farms, Production of Eggs and Poultry Meat

1960-67

Particular	1960	1961	1962	1963	1964	1965	1966	1967
Cattle on Farms (million)	11.8	11.9	11.9	11.07	11.6	12.0	12.3	12.4
Hogs on Farms (million)	5.7	6.0	6.7	6.9	7.4	8.0	7.4	7.2 ^{2/}
Egg - Production (million dzs.)	1080.0	1132.0	1131.0	1197.0	1267.0	1214.0	1255.0 ^{2/}	1255.0 ^{2/}
Poultry meat pro- duction (million lbs).	689.0	775.0	762.0	798.0	836.0	898.0	909.0	925.0

Source: Commonwealth Economic Committee, Meat; Dairy Produce
H.M.S.O., London; (Various issues)

^{2/} Estimated.

Annexure Table II

United Kingdom

High Protein Consuming Animal Units

1960-67

Particular	1960	1961	1962	1963	1964	1965	1966	1967	Projections 1975
Cattle (million)	5.9	5.9	5.9	5.8	5.8	6.0	6.1	6.2	7.1
Hogs (million)	2.8	3.0	3.3	3.4	3.7	4.0	3.7	3.6	4.4
Eggs (million doz.)	7.7	8.0	8.0	8.4	9.0	8.7	9.0	9.0	10.1
Poultry Meat (million)	3.1	3.3	3.4	3.5	3.7	4.0	4.0	4.1	5.0
Total (million)	19.5	20.2	20.6	21.1	22.1	22.7	22.8	22.9	26.6

Source: Annexure Table 1. (see note on methodology for converting livestock into high protein consuming animal units and for projections in background and methodology).

Annexure Table III

United Kingdom

Apparent Consumption of Oilcake Protein per

Animal Unit, 1960-67

Particulars	1960	1961	1962	1963	1964	1965	1966	1967	Projections 1975
Protein Consumption ('000 tons)	922.8	904.5	1019.6	946.1	927.2	976.0	334.2	375.8	111.0
Protein Consumption ('000 tons)	2030.2	1939.9	2243.1	2031.4	2039.8	2147.2	1945.2	1962.3	2442.0*
Protein Consumin g Units (million)	19.5	20.2	20.6	21.1	22.3	22.7	22.0	22.9	23.5
Consumption per unit (lbs.)	104.1	98.5	103.9	98.6	91.5	94.6	85.3	85.7	85.7
Cake consumption per $\frac{1}{2}$ Unit (lbs.)	236.6	223.9	247.5	224.1	203.0	215.0	193.9	194.3	194.3

Source: 1) U. K. Supply-Distribution Tables

2) Annexure Table II

1/ In terms of 44% Protein content

* In terms of 44% protein content oilcake these are 2522 thousand tonnes of oilseed cake.

Annexure Table IV

United Kingdom

Production of Compound Feeding Stuff

	1960	1961	1962	1963	1964	1965	1966	1967 +
	(Fiscal year) (in '000 metric tons)							
Cattle Food	3168	3100	3268	3159	3134	3378	3348	3537
Calf Food	(36.0)	(34.1)	(34.1)	(33.8)	(33.10)	(34.1)	(35.2)	(36.2)
Pig Food	1793	1880	2132	2073	2075	2253	1965	1974
	(20.4)	(20.5)	(22.8)	(22.1)	(21.9)	(22.7)	(20.7)	(20.2)
Poultry Food	3070	3955	3956	3956	4039	4097	4002	4103
	(41.8)	(43.5)	(41.3)	(42.3)	(43.2)	(41.4)	(42.2)	(41.9)
Horse and other compounds	155	157	175	170	159	173	180	174
	(1.3)	(1.3)	(1.3)	(1.8)	(1.3)	(1.8)	(1.9)	(1.7)
Total	3736	9103	9531	9353	9463	9901	9495	9793
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

Source: U.K. Ministry of Agriculture Fisheries and Food, Statistics I, Branch E.
Room 220 (East Block) White Hall Place, S.W.T.

+ The 1967 figures are provisional.

Figures in brackets are percent of total.

2. The European Economic Community

As observed in the chapter on world trade in oilcakes and meal, the E.E.C. is the world's largest import market for this commodity. In 1967 it accounted for slightly over 46 percent of world imports of oilcake and meal. Several factors indicate that the demand for high protein animal feedingstuffs will continue to increase, though the rate of growth in demand may decline. The rapid growth in oilcake and fishmeal consumption in these countries was the result, not merely of increased production of meat and dairy products, but also due to improved techniques of feeding. Whilst increased production of meat and dairy products will materialise, the demand for oilcakes will not be as greatly influenced by increased per animal unit consumption of oilcakes. It has been observed that in some countries viz. West Germany, consumption of high protein oilcakes and meal per animal unit has crossed levels which are considered to be optimum (as compared to the U.S.A.). However it must be remembered that the per animal unit consumption of such feedingstuffs is dependent on several factors viz. availability of substitute products and their relative prices, weather conditions, breeds etc. Under these conditions what is optimum in one country or region is not necessarily optimum in another. On the

whole the E.E.C. is relatively deficient in products like feedgrains (see country report West Germany), pasture land, farm byproducts etc.

The E.E.C. has been experiencing a particularly rapid rate of growth in per capita income levels as a result of rapid industrialisation. Thus between 1950 and 1963 gross domestic product (G D P) in the E.E.C. increased by 5.6 percent per annum.^{1/*} This compares to 4.2 percent for the developed group of countries as a whole. Of course, variations as between countries in the rates of growth of G D P did operate. For example, it was as low as 3.2 in the case of Belgium as against 6.8 in the case of West Germany. G D P, in these countries is expected to continue growing at the relatively high rate of 4.9 percent per annum between 1965 and 1975.^{2/} The differentials in the rate of growth as between countries as observed in the past is bound to affect per capita income levels in these countries. The impact of these rates of growth

1/ Food and Agriculture Organisation U.N. - Agricultural Commodities - Projection 1975 and 1985 Vol. II. Rome 1967 pp. 18.

* G D P at constant factor cost.

2/ Ibid. pp. 19 Table 1.5

on the demand for meat and dairy products is obvious. The income elasticity of demand for meat is 0.47 in the case of the E.E.C. as against 0.44 in the case of Western Europe as a whole, 0.21 in the case of U.S.A. and 0.26 in the case of Canada. Considerable differences exist among member countries in the per capita consumption of meat and livestock products. Per capita meat consumption levels vary as between different countries, so also the pattern of meat consumption varies. For example, as against a per capita consumption of total meat in the E.E.C. of 49.6 kgs in 1961-63, it was 64.4 kgs in the case of France and only 28.0 kgs in the case of Italy. Levels of the different types of meat consumed show similar variations amongst the E.E.C. member countries. These variations are the result of 1) differences in real per capita income; 2) differences in consumer tastes and preferences, and 3) differences in the retail price relationships amongst livestock products. The E.E.C. has been vigorously pursuing a policy of self-sufficiency in meat and dairy products. Production of these commodities is encouraged both by administered price levels for the domestic produce, as well as a system of trade barriers. The result has been that the E.E.C. has become increasingly less dependent on imports of meat and dairy products.

The F.A.O. has forecast rapid rates of growth in the demand for the different types of meat. Using these growth rates, it is observed that production of poultry meat in the E.E.C. will increase by 48.6 percent between 1968 and 1975; the overall growth between 1968 and 1975 in the case of beef and veal is 20.7 percent, 26.1 for eggs and, 18.9 for pork. This growth, however, has limited use for estimating the demand for high protein animal feedstuffs in the E.E.C. because of changes envisaged in the per animal unit consumption of these products.

Supply-
Distribution
of oilseeds
and oilcakes

Annexure-I Tables A to I give supply-distribution for oilcake and meal for the E.E.C. group of countries. The E.E.C. has very limited production of oilseeds. Though oilseeds production increased from 276,700 tons in 1960 to 671,500 tons in 1967, these provide an almost insignificant proportion of apparent cake and meal consumption requirements of these countries. Rapeseed production, which accounts for over three-fourth of total oilseed production in the region, has expanded mainly on account of guaranteed minimum prices. As an animal feedstuff, rapeseed cake is relatively inferior-relative to the meals of such other oilseeds as soyabean, groundnut cottonseed, etc. Though one may, therefore, visualise a rapid growth in the production of rapeseed, it is unlikely to make any significant impact on the import demand for oilcakes.

Almost the entire requirements of the E.E.C. for oilcakes and meal, are met in the form of imports. Imports of oilseeds in the E.E.C., increased by almost 40 percent between 1960 and 1967.^a On the other hand import of oilcakes increased by as much as 154 percent. The reasons for these relative rates of growth in the imports of oilcakes in the form of oilseeds and imports of oilcakes and meal as such, have already been discussed in the chapter dealing with world trade in this commodity.

Examining the pattern of oilseeds imports, it will be observed that not all oilseed imports have increased at the same rate. The most outstanding expansion occurred in the case of soyabean, its share of total oilseed imports which was already high in 1960 at 49 percent increased further to 56 percent by 1967. The oilseed next in the order of importance in imports by the E.E.C. is groundnuts, these originate mainly from the Associated Territories of the E.C.M. in Africa. Groundnuts account for 15 percent of the total imports of oilseeds. Though sunflower seed recorded an increase of almost 180 percent, this oilseed still accounts for a very small proportion of total oilseed imports of E.E.C. countries (see Annexure Table 'B'). The E.C.M.

re-exports a very small proportion of oilseeds available in the member countries.

Imports of oilcakes into the E.E.C. countries are shown in Annexure Table 'F'. The most outstanding feature of E.E.C. imports of oilcakes is the sharp increase in imports of soyabean meal. Imports of soyabean meal increased by 473 percent between 1960 and 1967; its share increased from 19% of total oilcake and meal import in 1960 to almost 44% in 1967. Whereas at the outset of the period analysed, imports of oilcakes were more evenly distributed, by 1967 with the impact of soyabean cake imports, the pattern underwent a radical change. Imports of groundnut meal and cake increased by 153 percent. This oilcake now accounts for 9.7 percent of the total meal imports of the E.C.M. Imports of copra increased at more or less the same rate (152 percent) as groundnut meal. Linseed meal which in 1960 accounted for 22 percent of the total meal imports failed to keep pace with the growth in total imports and by 1967, its share was drastically down at 10.1 percent. Sesamum - a relatively unimportant oilcake in E.E.C. imports also declined drastically. Imports of palm kernel cake remained more or less stagnant with the growth of only 16.5 percent over the entire period. Imports of cottonseed and rapeseed cake increased by 101 percent and 114 percent respectively.

Fishmeal imports into the E.C.M. countries recorded a very rapid expansion between 1960 and 1964. Thereafter this commodity imports have remained more or less stagnant. A substantial proportion of fishmeal imports into the E.C.M. are accounted for by West Germany.

The E.E.C. also undertakes a substantial re-export trade in oilcakes. Such re-exports of oilcakes (Annexure Table G) increased only slightly from 587,000 tons in 1960 to 886,000 in 1967. Of these soyabean cake exports account for around 50 percent. Rapeseed cake exports have increased rapidly and add another 20 percent of the re-export trade in oilcakes. The re-export trade is almost entirely an intra-E.E.C. trade.

The apparent consumption of oilcakes and meal including fishmeal are shown in Annexure Table H - Net Availability of Oilcakes and Meals Including Fishmeal. Apparent consumption of oilcakes and meal in the E.C.M. countries doubled between 1960 and 1967 from 4,268,000 tons to 8,470,000 tons.

The E.E.C. group of countries have increasingly adopted sophisticated animal feeding techniques. The impact of the vast technological developments in animal

feeding and improvement in growth rates of animals through scientific breeding developed in the U.S.A., and North Western Europe are now being felt in the E.E.C. countries as well. Given limited resources of animal feedingstuffs, the need to adopt efficient feeding techniques was inevitable if the rapidly rising demand for meat and livestock products on the one hand and the policy of self sufficiency had to be fulfilled. The impact of these is easily recognised in the growth of the compound feedstuff industry. Consumption of oilcakes directly as animal feed is being reduced. In West Germany, for example, direct feeding of oilcakes is now down to 30-40 percent as against a much **higher** proportion in the earlier years. Similar is the case in France where direct feeding at present accounts for around 40% of total oilcakes consumed.

Compound
Feedstuffs
for Animals

The impact of improved feeding techniques is observed in the growth of the compound feedstuff industry (see Annexure II). The output of this industry increased from 15.6 million tons in 1961-62 to 24.7 million tons in 1966/67 i.e. increase of 58 percent over the six year period.

Examining the structure of the compound feed industry, production of poultry feed accounts for the largest proportion of compound feeds produced in the E.E.C. Its share has tended

to decline relatively from 41.5 percent in 1963-64 to 37.2 percent in 1966-67. The reason for this large proportion of poultry mixed feed production is the development of the broiler industry. This industry owes a substantial part of its growth to American influence and the marketing and sales programme of U.S. soyabean interests.

Hog feed is the second most important compound feed in the E.C.M. group of countries. Its share in total output of mixed-feeds shows fluctuations. Production of this mixed feedstuff remains more or less stagnant in the early 1960's upto 1963-64, thereafter, it shows a sharp upward plunge. Production of cattlefeeds has increased at a particularly rapid rate since 1963-64. This expansion reflects in the main the E.E.C. efforts in the production of beef.

One factor that is bound to emerge from the emphasis on increased production of animal feedstuffs is the growing importance of feed grains in these countries. Feed grain prices have been relatively high (relative to the U.S.A., U.K. and Japan) as a result of the grain

policy of the E.C.M. and trade barriers in feed grains. In most of the E.C.M. countries - Germany, Belgium and Italy, the spurt in production of feed grains in the past two years has had a marked impact on the level and pattern of demand for mixed feedstuffs. The impact on oilcake imports is also obvious, imports of oilcakes and meal in 1967 were more or less of the same level as in 1965. This is also observed in the growth of the mixed feeds industry. Production of mixed feeds increased on an average of 11.5 percent per annum between 1963-64 and 1965-66; in 1966-67, however, production increased by only 7.8 percent over the previous year. The impact of this was immediately reflected in the demand for oilcakes. As in the case of most European countries increased production of own farm produce, say feedgrains, potatoes, other legumes etc., immediately reflects itself in a reduced demand for compound mixed-feedstuffs and oilcakes. This tendency is common, the farmer prefers to use his own farm produce whenever these are available at relatively cheaper prices. These relatively lower prices may result from a decline in the prices of farm produce due to increased production or a relative rise in the price of mixed feed products and oilcakes.

Some Aspects of
E.C.M. Trade in
Oilcakes (with
special reference
to India)

The import trade in oilcakes in all these countries is mostly concentrated in the hands of a limited number of brokers or shippers. There is very little of direct import of oilcakes by the end users. A limited number of agricultural co-operatives do undertake direct imports. However, these imports are restricted to such of the co-operatives that have large feed-mixing units of their own - viz. in Italy and West Germany. In some countries viz. Belgium and France, the U.K. brokers like European Grain, Raynors, Bunge etc. are used as principals for imports of oilcakes. A substantial part of the import business in oilcakes is handled by international shippers and/or brokers. Again, whilst several brokers do this business the trade in oilcakes tends to be concentrated in the hands of a limited number of firms. Commission rates vary between 0.25 to 0.5 percent depending on firms-size of operations, reputation etc. The contract used is almost always the LCFTA contract No.15.

The E.C.M. group of countries import most of their oilcake requirements in the form of bulk shipments. Lower freight costs and port handling charges

because of automatic handling (high labour costs in these countries are wellknown) are the main advantages. The E.C.M. is adequately served by bulk handling facilities at Rotterdam, Amsterdam, Hamburg, L'Havre, Marsielles etc. Bulk imports at these ports are transhipped in barges or lighters to the smaller ports depending on the market or location of feed plant and in order to meet requirement of the compound feed manufacturers with varying size of operations. Most of the compound feed manufacturers, more especially the larger ones, are located in port towns and are termed what is generally called "deep water mills". For example, Marsielles and L'Havre are not areas where oilcake is used, most of the compound feed manufacturing units are located at Rouenn, Bourdeaux, and Dunkirk in France. The same is true in the case of West Germany. In the case of the E.C.M. countries bulk shipment is certainly an important factor which Indian exporters would have to cope with in the long run. The U.S. exporters of soyabeans and soyabean meal have been best able to exploit this form of shipment to the maximum. The Rhine river provides for low cost transport by boats. However, in the short run, this does not rule out shipment in bagged form by charter to those major ports from where transhipment by lighters can be undertaken. In fact,

some part of oilcake imports is still in this form, though declining steadily.

As regards quality, there is undoubtedly an increased emphasis on quality of oilcakes and meal requirements. In the case of France, Italy and West Germany there are no administrative restrictions on the quality of oilcake imports. In Belgium, however, administrative restrictions on quality specifications are very rigid. The importer is held responsible and is required to meet the quality specifications as laid down in a codex for different types of animal feeding stuffs. If the imported product does not meet the quality specifications, the cargo is admitted on a guarantee by the importer that defects would be remedied by him. Such concessions are extremely limited. This codex, it is feared, may be extended for the E.C.M. group of countries as a whole. If implemented it would tend to have a restrictive impact on oilcake exports from the developing group of countries to the E.C.M. We were, however, informed in the course of our foreign markets survey, that such an extension of the codex would have to be modified if, it were to be

made applicable to all E.C.M. countries. Coming to the quality specifications of imports for the E.C.M. as a whole, whilst there are no restrictions at the stage of oilcake imports, the restrictions are of some importance in manufacture of compound feedstuffs. In most E.C.M. countries the compound feed manufacturer is required to declare the contents and their analysis on the container. In these circumstances, though quality is of importance, defects can be remedied at the manufacturing stage - viz. mixing. As in the U.K. importers in France, West Germany and Italy, are willing to absorb oilcakes and meals in so far as contract specifications are strictly adhered to. We know that LCFTA contract specifications on quality are not trade restrictive.. In the case of West Germany, importers are required to fumigate the oilcake cargo if it fails to satisfy certain conditions of hygiene. This requirement involves considerable cost to the importer. One may, in general, conclude that quality consistency and adequate supply rather than a very high quality as such, play a more important role in the E.C.M. group of countries as a whole. The E.C.M. compound feed manufacturers, especially the large ones, where most of this product output is concentrated, are extremely price conscious. This is reflected in the use of the computer in order to

bring about a least cost product mix which at the same time satisfies feed efficiency requirements.

Shipment on time and regularity of supplies are points which Indian exporters need to adhere to particularly.

Expellers though preferred in some areas, have no specific advantage over extractions.

Importers in this region, generally, did not have complaints regarding communication facilities with India. Their business is to a large extent determined by information from U.K. shippers or their subsidiary concerns operating in these countries. To establish their own communications facilities with India viz. telex, they think would be very expensive at present considering the small turnover. In this regard the soyabean meal exporters are at a relatively great advantage. Apart from the excellent communications facilities, the presence of representatives of soyabean and meal exporters from the U.S.A. in the meal importing countries provide good liaison and allow for quick decisions.

A point for Indian exporters again, is the need for increasingly adhering to the contract specifications

as regards quality, shipping schedules and early settlements of payments for short shipment and delivery of goods below contract specifications if they occur. Unethical business practices of a few unscrupulous Indian exporters have to some extent affected the confidence of the E.C.M. importers. They generally favoured the need to evolve some system of guarantee which could lessen the degree of uncertainty of their transactions with Indian exporters. The impression gathered, was that Indian groundnut extractions and cottonseed cake and meal could find, a good market in the E.C.M. provided they were offered at international prices and adequate supplies would be available for them. As it is, they think that the large volume of Indian oilcake trade with the E.E.C. block of countries at prices they cannot afford to pay will not permit them to import large quantities of Indian oilcakes.

Conclusions

Looking at prospects in general, the evolving E.C.M. policy of agricultural prices and trade, make it difficult to arrive at an accurate estimate of the likely growth in the imports of high protein animal feedstuffs. Net availability of oilcakes and meal including fishmeal, (used by us as apparent consumption of these products) for the period 1962 - 67 show an annual

average growth of 15 percent per annum. We have already observed that the problem of vegetable oil disposal is likely to damp the growth in imports of meal in the form of oilseeds. This may partly be offset by imports of low-oil content seeds - viz. soya - at the cost of high oil content oilseeds. This has already been in evidence - increased imports of soyabeans and the relatively higher rate of growth in imports of oilcake and meal as such. At the same time, there are factors - growth in use of feedgrains, cut in the direct use of oilcake as animal feed etc. which are likely to influence meal imports. As informed guess would place growth in meal imports as such at no less than 3 percent per annum between 1968 and 1975. Clearly given the large import base, the E.C.M. will continue to dominate world imports of oilcake and meal and provide a large market for oilcake exports. Considering that Indian exports form an extremely limited proportion of E.C.M. oilcake meal imports at present, the scope for increasing our exports to this region is obvious.

Annexure I

Table A

EUROPEAN ECONOMIC COMMUNITY (BELGIUM, WEST GERMANY,
FRANCE, ITALY AND NETHERLAND)

		(in '000 metric tons)							
		<u>PRODUCTION OF OILSEEDS</u>							
		1960	1961	1962	1963	1964	1965	1966	1967
(U)									
Groundnut	12.2	13.2	12.2	11.2	11.2	11.2	11.2	11.2	11.2
Soyabean	-	-	-	-	-	-	-	-	-
Cottonseed	9.1	9.1	6.1	9.1	8.1	8.1	8.1	8.1	8.1
Sunflower seed	12.1	13.1	29.1	43.1	31.1	23.1	25.1	27.1	27.1
Rape/Mustard	170.2	200.1	294.2	246.1	365.1	461.1	434.1	542.7	542.7
Linseed	72.1	69.1	73.1	72.1	33.1	34.0	91.5	81.4	81.4
Sesamum seed	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Castor seed	-	-	-	-	-	-	-	-	-
Palm Kernel	-	-	-	-	-	-	-	-	-
Copra	-	-	-	-	-	-	-	-	-
Total	276.7	310.6	420.7	337.6	499.6	567.5	571.0	671.5	671.5

Source: See table I - I below.

Annexure I

Table B

EUROPEAN ECONOMIC COMMUNITY

IMPORTS OF OILSEEDS

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut (S)	595.3	739.0	764.3	826.5	714.3	750.0	360.6	326.2
Soyabean	1379.3	1546.2	2035.3	1974.1	2513.4	2379.3	2941.5	3003.5
Cottonseed	1.0	1.0	25.4	26.4	1.0	9.4	4.1	-
Sunflower seed	73.2	120.9	65.0	101.6	103.4	104.4	155.3	220.5
Rape/Mustard	39.3	127.9	156.9	154.3	109.6	254.6	323.9	314.3
Linseed	223.1	223.0	185.9	135.7	234.6	206.7	329.2	233.3
Sesamum	29.5	24.4	25.4	39.6	33.5	39.1	47.3	41.5
Castor seed	44.6	34.5	42.6	33.6	43.6	43.9	49.1	45.7
Palm Kernel	396.3	377.1	363.7	355.5	373.9	334.3	330.3	183.6
Copra	535.3	554.7	435.1	507.1	571.2	521.5	613.2	509.7
Others	-	-	-	-	-	-	-	-
Total excluding Castor	3334.4	3714.2	4122.0	4150.3	4660.4	4610.3	5617.4	5323.1

Source: see Table I - I below.

EUROPEAN ECONOMIC COMMUNITYEXPORTS OF OILSEEDS

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	1.0	1.0	3.0	3.0	3.0	4.6	0.4	0.4
Soyabean	-	-	-	-	-	-	-	-
Cottonseed	-	-	-	-	-	-	-	-
Sunflower seed	-	-	-	1.0	14.2	0.4	5.3	3.0
Rape/Mustard	22.2	44.5	85.3	34.1	134.9	138.7	139.0	143.3
Linseed	15.2	20.3	16.2	27.3	27.4	27.2	23.0	30.9
Sesamum	-	-	-	-	-	-	-	-
Castor seed	-	-	-	-	-	-	-	-
Palm Kernel	-	-	-	-	-	-	-	-
Copra	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-
Total	39.4	65.8	105.5	115.4	179.5	130.9	173.6	177.6

Source: see Table I - I below

Annexure I

Table D

EUROPEAN ECONOMIC COMMUNITY

OILSEEDS AVAILABLE FOR CHUSHING

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut (S)	603.4	747.2	739.8	331.3	710.6	763.2	839.0	833.6
Soyabean	1370.3	1543.2	2035.3	1974.1	2513.4	2379.3	2941.5	3003.5
Cottonseed	10.1	10.1	31.5	35.5	9.1	17.5	12.2	3.1
Sunflower seed	91.3	139.0	94.1	143.7	120.3	126.1	175.6	244.6
Rape/Mustard	237.3	233.5	374.8	316.3	339.8	577.0	624.0	713.7
Linseed	235.0	271.8	247.8	210.5	290.3	253.5	391.3	233.8
Sesamum seed	30.5	25.4	20.4	40.6	34.5	40.1	43.3	42.3
Castor	1.0	34.5	42.6	33.6	43.6	42.9	49.1	45.7
Palm Kernel	396.3	377.1	368.7	355.5	378.9	334.3	330.3	133.3
Copra	535.3	554.7	435.1	507.1	571.2	521.5	613.2	509.7
Total excluding Castor	4099.0	3955.0	4435.5	4419.6	4977.1	5013.5	6011.4	5336.6

Source: see table I - I below.

Annexure ITable E.EUROPEAN ECONOMIC COMMUNITYOILCAKE EQUIVALENT OF OILSEED CRUSHED

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	337.9	413.4	431.1	465.5	493.0	427.4	436.1	466.8
Soyabean	1234.6	1221.5	1607.9	1559.5	1935.6	1330.0	2323.3	2376.7
Cottonseed	4.2	4.2	13.2	14.9	3.8	7.3	5.1	3.4
Sunflower seed	61.2	93.1	63.0	99.6	30.6	34.5	117.6	163.9
Rape/Mustard	130.5	155.9	206.1	174.0	186.9	317.3	343.2	392.5
Linseed	132.4	173.9	158.6	134.7	135.3	162.2	250.7	194.3
Sesamum Seed	15.9	13.2	13.7	21.1	17.9	20.3	25.4	22.2
Castorseed	-	-	-	-	-	-	-	-
Palm Kernel	203.1	195.1	191.7	134.9	197.0	174.1	171.7	93.2
Copra	137.5	194.1	169.3	177.5	199.9	132.5	216.7	173.4
Total	2310.3	2470.4	2355.1	2331.7	3260.5	3256.1	3940.3	3956.3

Source: see Table I - I below

Annexure I

Table F

EUROPEAN ECONOMIC COMMUNITY
IMPORTS OF OILSEEDS & MEAL

	(in '000 metric tons)							
	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	175.5	247.2	371.6	375.7	327.0	356.5	400.1	444.2
Soyabbeans.	351.0	356.3	755.5	319.4	1020.0	1341.0	1329.0	2013.1
Cottonseed	165.7	170.0	256.2	237.9	253.0	334.3	357.7	332.9
Sunflower seed	145.2	139.1	222.1	193.5	130.4	175.4	349.3	346.5
Rap./mustard	54.2	62.6	90.8	95.4	85.3	100.3	135.3	115.0
Linseed	391.3	436.5	532.1	612.2	640.1	674.9	536.1	465.5
Sesame.	10.7	33.0	30.6	31.7	27.9	24.4	30.3	12.0
Castorseed	-	-	-	-	-	-	-	-
Palm Kernel	195.7	133.3	213.1	135.6	223.1	226.3	261.1	216.4
Copra	166.4	194.5	216.7	277.4	344.9	357.4	423.0	420.0
Other	150.9	190.6	210.5	220.3	207.6	277.7	325.7	216.5
Total	1904.6	2063.1	2949.2	3079.1	3264.3	3869.2	4693.1	4513.7

Source: see table I - I-below

EUROPEAN ECONOMIC COMMUNITY
EXPORTS OF OILCAKES & MEAL

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	35.5	55.0	52.3	63.5	66.0	43.5	70.3	56.7
Soyabean	310.4	332.3	311.0	303.2	365.3	359.7	341.3	439.3
Cottonseed	3.2	4.7	4.1	3.3	2.3	0.7	2.9	1.1
Sunflower seed	2.6	7.5	21.2	10.9	30.0	16.6	13.4	20.9
Rape/Mustard	25.3	43.0	35.6	33.1	63.6	135.6	133.2	171.7
Linseed	30.7	57.0	31.9	37.6	64.1	63.7	59.5	46.7
Sesamum	0.1	0.2	-	-	0.1	0.1	0.1	0.2
Palm Kernel	35.3	87.6	93.2	65.7	105.2	86.3	75.6	42.6
Copra	45.9	49.9	39.5	44.2	45.9	50.0	53.3	53.4
Others	35.1	53.2	36.3	46.9	53.3	61.5	71.2	52.0
Total	537.1	705.4	725.1	661.9	800.3	823.2	876.3	835.4

Source: see table I - Below

Annexure I

Table H

EUROPEAN ECONOMIC COMMUNITY

NET AVAILABILITY OF OILCAKES & MEAL AND FISHMEAL

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	477.8	610.4	750.2	772.6	863.7	740.2	815.7	854.1
Soyabean	1525.0	1245.3	2052.2	2075.6	2640.0	2861.2	3810.3	3949.7
Cottonseed	106.7	169.5	265.2	298.9	259.5	341.4	369.9	335.2
Sunflower seed	293.6	274.5	263.7	232.0	150.8	243.0	453.3	439.3
Rape/Mustard	159.2	175.3	211.1	186.1	203.9	281.8	295.1	336.6
Linseed	553.0	553.2	703.5	709.1	761.5	763.2	757.3	603.7
Sesamee	34.4	50.9	44.2	52.7	45.6	45.0	55.4	34.5
Palm Kernel	306.3	291.5	311.5	233.5	314.6	313.0	357.1	271.0
Copra	306.8	338.5	346.7	410.4	493.7	489.7	505.3	544.7
Others	112.0	122.4	124.2	173.4	154.3	216.2	254.5	163.9
Potato	3026.4	3831.5	5077.5	5244.3	5722.6	6300.5	7755.4	7533.5
Fishmeal	441.6	561.5	692.5	660.1	339.1	834.8	759.6	857.0

Source : See Table 1 - I below

Table I

EUROPEAN ECONOMIC COMMUNITY

RAW PROTEIN EQUIVALENT OF OILCAKES & MEAL (INCLUDING FISHMEAL)

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	243.3	317.2	339.9	401.4	344.3	334.6	423.9	443.9
Soyabean	701.3	572.5	943.3	954.5	1214.2	1316.0	1752.7	1316.6
Cottonseed	63.1	63.3	103.3	122.3	106.1	139.7	151.4	137.1
Sunflower seed	75.1	101.2	97.3	104.1	66.6	89.7	167.7	130.3
Rape/Mustard	57.2	62.9	75.3	66.7	73.2	101.3	106.1	121.0
Linseed	191.3	193.3	254.9	254.9	273.9	276.3	272.4	217.1
Sesamum	13.6	20.3	17.6	20.9	13.1	17.3	22.0	13.7
Palm Kernel	55.0	52.3	56.0	50.3	56.5	56.3	64.0	43.3
Copra	67.2	74.2	75.9	90.1	109.5	107.4	123.6	119.6
Others	41.6	45.4	45.9	64.1	57.0	30.0	94.1	60.7
Fish meal	237.0	365.0	450.1	429.0	545.4	542.6	493.7	576.5
Total	1306.3	1379.1	2515.5	2553.3	2365.3	3111.7	3676.6	3735.3

Source: Supply-Distribution Tables 1) West Germany, 2) Italy, 3) Netherlands, 4, Belgium

5) France Notes: (S)= Shelled, (U) = Unshelled

E.E.C. : Apparent Consumption of Oilcake Protein for

Animal Unit, 1960-66

	1960	1961	1962	1963	1964	1965	1966	1975
Protein Consumption (1000 tonnes)	1806.3	1879.1	2515.5	2553.8	2865.3	3111.7	3076.6	4650.0
Protein Consumption (million lbs.)	3973.0	4134.0	5534.1	5629.4	6303.7	6845.7	8088.5	10230.0
Protein Consuming units (million)	66.0	69.6	72.4	72.8	76.7	78.0	80.6	102.0
Consumption per unit (lbs.)	60.2	59.4	76.4	77.3	82.3	87.3	100.3	100.3 ^c
Oilcake consumption per unit (lbs.)*	137	135	174	176	187	200	223	223 ^c

* In terms of 44 percent protein content

E.E.C. : PRODUCTION OF COMPOUND-MIXED FEEDS (BY MARKETING YEAR, BY LIVE-STOCK GROUPS).

Type of Feed	1961-62 to 1966-67				
	1961-62	1962-63	1963-64	1964-65	1965-66
	(in '000 metric tons)				
	(1)				
Poultry feed	6144 (39.3)	6674 (40.2)	7172 (41.5)	7711 (33.5)	8661 (37.8)
Hog Feed	5305 (33.9)	5421 (32.7)	5305 (30.7)	6565 (32.8)	7630 (33.5)
Cattle Feed	3755 (24.0)	4032 (24.6)	4179 (24.2)	5135 (25.7)	5837 (25.5)
Other Feeds	435 (2.6)	419 (2.5)	613 (3.6)	600 (3.0)	719 (3.1)
Total	15639 (100.0)	16596 (100.0)	17274 (100.0)	20011 (100.0)	22397 (100.0)

Source: Fachverband der Futtermittelindustrie, HAMBURG.

(1) Partly estimated from Z.M.P., Bonn

(2) Figures for Belgium from the National Institute of Statistics.
Figures in brackets show percentages of actual totals.

3. West Germany

West Germany is the world's largest import market for oilcakes. Domestic production of rapeseed provides a negligible proportion of her requirements of vegetable oils and oilcakes. In 1967, in spite of a record 68,500 tons of cake produced from domestically grown rapeseed, West Germany imported 98 percent of her oilcake consumption requirements.

The table below presents the broad trends, in the oilcake import dependence of West Germany.

Table 1. WEST GERMANY - IMPORT DEPENDENCE IN OILCAKE
('000 tonnes)

		1954	1960	1964	1967
A	..	427.9	1006.4	1361.7	1522.1
B	..	8.2	38.1	60.0	68.5
C	..	321.3	878.2	1528.7	2138.4
D	..	566.6	1677.3	2713.8	3413.4

- A Domestically produced oilcakes from imported seed
- B Domestically produced oilcakes from domestically produced seed (rapeseed)
- C Imports of oilcakes
- D Consumption of Oilcakes

NOTE: A+B+C is not equal to consumption because West Germany exports oilcakes to some of her E.C.M. partners.

Source: See West Germany Supply-Distribution Tables.

Over the past 17 years, imports of oilcakes by West Germany have risen very sharply. Over the period 1954 to 1960, consumption of oilcakes increased from 0.56 million tons to 1.67 million tons i.e. at an average expansion rate of 33 percent per annum. This rate of growth has, thereafter, tended to decline. Between 1960 and 1964 consumption increased on an average per annum basis by 16 percent and in the following three years the rate was almost halved to 8.4 percent. Imports of oilcakes in the 1960's increased at a relatively higher rate than imports of oilcakes in the form of oilseeds. Between 1954 and 1960, imports of the cake equivalent of seed increased by 141 percent, as against an only slightly higher level for oilcakes as such - 162 percent. Between 1960 to 1964 and 1964 to 1967 while the cake equivalent of imported seed grew by 36 and 11 percent only, imports of oilcakes increased by 77 and 40 percent for the respective periods. Notice that though the rate of growth of imported oilcakes (cake equivalent of seed + cakes and meal) tended to slow down, it still continues to be of a relatively high order. Given the levels of imports and the

growth rates, West Germany will continue to be an important market for oilcakes and meal.

Production of
Oilcakes in
West Germany

The detailed data on trends and composition of West German oilcake production are given in the Supply-Distribution tables. The main features are: (1) the increasing importance of soyabean crushing in West Germany over the past decade and a half and (2) the relative decline in the shares of all other seeds crushed.

The general factors operating in the world vegetable oil economy - increased crushing in the producing countries, and relatively uncertain supplies of oilseed in exporting countries - affected the German oil crushing industry as well. However, the more important reason for the relatively low rate of growth in oilseed crushing has been the problem of surplus fats and oils situation in most advanced countries. This is reflected also in the relative growth rates of soyabean with a low oil content and the tropical oilseeds with high oil content. Crushing margins which are poor in almost all E.C.M. countries are more so in West Germany, costs of production are much higher than in other E.C.M. countries. The process of shifting of oilmills to wharf sites and large scale operation has been largely completed.

Table 2: WEST GERMANY - COMPOSITION STRUCTURE OF OILCAKES
PRODUCTION

('000 tonnes)

	1956	1962	1967
Soyabean	418.3 (62.3)	843.5 (72.7)	1264.3 (79.5)
Copra	105.5 (15.7)	81.4 (7.0)	83.2 (5.2)
Rapeseed	24.9 (3.7)	81.1 (7.0)	104.1 (6.4)
Palm Kernel	54.4 (8.2)	64.4 (5.6)	35.7 (2.3)
Peanut	27.4 (4.7)	58.0 (5.0)	51.4 (3.3)
Sunflowerseed	15.4 (2.2)	13.6 (1.2)	15.3 (1.0)
Linseed	3.9 (Neg.)	7.1 (0.6)	36.0 (2.3)
Others	23.1 (3.5)	10.2 (0.9)	-
Total	671.9 (100.0)	1159.3 (100.0)	1590.6 (100.0)

(Figures in brackets are percentage of total)

Source : West Germany - Supply-Distribution Tables.

Substantial excess capacity, however, is still in existence. Considering the compulsory closure during the summer holidays, capacity utilised works to less than 70 percent. Some expansion in soyabean crushing can be expected at the cost of other oilseeds, the basis being the growth in demand for cake and not oil. The German crushing industry is protected to the extent of a 4 percent ad valorem duty on imports of oilcake. Though there is talk of the need for a tariff protection because of the poor margins in crushing, this is unlikely to materialise.

Domestically produced cake certainly has certain advantages in that assurance of quality can be more easily provided to the compound feed manufacturer, supplies are more easily available and guaranteed for ready delivery. The crushing of soya for ensuring these is particularly good. However, it is unlikely that production will expand to any marked extent, given the present problem of disposing the oil and increased competition of vegetable oil supplies from competing countries - viz. sunflower seed oil from Eastern Europe this year.

Consumption
of Oilcakes
in West
Germany

Table 3: WEST GERMANY: OILCAKE CONSUMPTION PATTERN

(percent of total)

Oilcakes/Types	1956	1960	1967
Copra	19.8	13.6	11.5
Palm Kernel	21.5	15.4	7.1
Peanut	7.3	4.9	5.2
Soyabean	25.1	39.1	53.6
Sunflower	5.2	3.7	3.6
Rapeseed	3.8	3.6	3.4
Linseed	11.4	9.8	6.1
Cottonseed*	N.A.	4.0	5.4
Others	5.8	5.9	4.1
Total	100.0	100.0	100.0
('000 tons)	781.9	1677.3	3413.4

* Net trade in cottonseed cake

Source: ISTA, OILWORLD QUARTERLY, HAMBURG

Oilcake consumption in West Germany was spread over a wide range of oilseeds during the early 1950's when soya had yet to make a large impact on the world markets. However, with the growth of trade in soyabeans and increasing crush of the other oilseeds in producing countries the pattern of oilseed cake consumption underwent a change in West Germany. Copra, palm kernel and linseed cake which together accounted for 52.6 percent of the total cake and meal consumption experienced a decline in their combined share to 38.8 percent by 1967. On the other hand, soyabean meal has been able to get the lion's share of this rapidly expanding market. The share of soya rose from 25 percent in 1956 and 39 percent in 1960 and again, to almost 54 percent in 1967. However, it must also be observed that consumption of all oilcakes grew in absolute terms in the German oilcakes market.

In addition to vegetable oilseed cakes and meal, West Germany is the world's second largest market for fishmeal (following the U.S.A.), accounting for 16 percent of the world net imports in 1967. Being a high protein content product fishmeal adds substantially to the protein availability for animal feeds. Imports of fishmeal increased rapidly from 193,000 metric tons in 1960 to

460,000 tons in 1967. West Germany also produces a relatively large but stable quantity of fish meal, this has averaged 85,000 tons during the past few years. Neither the production nor the imports of meat meal are important nature in West Germany.

Imports of Manioc, a low protein animal feed - has been on the increase in the West German feed market. Manioc used in combination with urea is yet another product being used in West Germany. No estimates of the amount of urea consumed for feeding purposes are available. However, it has been estimated that it accounts for 2-3 percent of the total mixed feed consumed. Apart from the fact that at present West German feed manufacturers do not find urea economic, the experience has been that urea is not received favourably by feed users. In the short run of 5 years or so, it is unlikely to make any further serious inroads into the markets for oilcakes and fishmeal.

The growth in demand for oilcakes in West Germany is the outcome of the development of the meat and dairy products industry and more especially the development of the broiler industry. Techniques of feeding have changed in favour of improved feed - conversion ratios and improved breeding practices. Each of these developments has had an impact on the demand for oilcakes as a whole as well as types of oilcakes.

Even though German agriculture has been increasingly mechanised to cope with labour shortage and rising wages, the small type farm operation continues to be very important. The influence of direct feeding of oilcakes in the pre-war and early post-war years has been on the decline. At present about 40 percent of the oilcakes consumed in West Germany is still in the direct form, the farmer prepares his own feed mix. The adoption of improved feeding techniques would make for lower per animal oilcake consumption. However, the inroads of mixed feed have been relatively lower in the case of cattle and pigs as compared to poultry, where broilers consume almost entirely mixed feeds. West Germany, moreover, relative to other North European countries like the Netherlands, and Sweden has large pasture land resources; clover and alfalfa which are high protein feeding materials are also produced in Germany. In addition, West Germany produces coarse grains (also imports these), potatoes, legumes, other root crops viz. sugarbeet pulp and tops all of which play an important role in supply of animal feedstuffs in the existing structure of dairy cattle and pig raising. Milk, both whole and skimmed, has been on the decline in use as feed for animals.

The Mixed-feed
Industry

West Germany has again the distinction of being one of the largest mixed-feed producers in the world. Its rate of growth may be observed from the following table:

Table 4: WEST GERMANY: GROWTH OF THE MIXED-FEED INDUSTRY
BY TYPE

(Index 1957 = 100)

Type of Mixed-Feed	1957	1961	1964	1967
Cattle	100	151.5	203.6	307.7
Calves	100	173.2	284.7	507.4
Hogs	100	137.3	188.5	291.8
Poultry	100	178.4	266.9	369.4
Total	100	157.2	225.4	333.2

Source: West Germany: Production of Compound
Feedstuffs : Annexure Table IV

The compound feed manufacturing industry in Germany is spread over a large number of manufacturers, varying widely in their size of operations. The more important manufacturers belong to two associations located at Bonn and Hamburg.

(The names of the associations and the more important feed manufacturers are listed in a separate volume of this study. In this industry, as in crushing, the larger manufacturers have made a headway at the cost of small manufacturers. Production of mixed feeds increased on an average by 23 percent per annum over the 1957 to 1967 decade. Contrary to the trends in oilcake imports, it will be observed that the mixed feed industry grew at a higher rate between 1964 and 1967 than during the earlier period. It must be noted that West Germany and some other countries in Europe consumed a higher proportion of oilcake per animal unit, i.e. at levels which are above optimum in the new feeding techniques developed. It is likely, therefore, that oilcakes used per unit of mixed feed produced has declined.

The structure of the mixed feed industry shows the rapid growth of the poultry or broiler industry in West Germany. The broiler industry generally uses only compound mixed feeds, the structure of the industry and the techniques used in broiler production make this inevitable. Again, oilcakes are used to a large extent in direct feeding for cattle and pigs at the farm level. Hence the relative rates of growth of mixed feeds do not give an entirely correct picture of the growth in demand for oilcakes.

Table 6: WEST GERMANY: INGREDIENTS USED BY COMPOUND-FEED MANUFACTURERS

(The organized industry only)

('000 metric tons)

Ingredients	1953/54	1962/63	1963/64	1964/65	1965/66
Grains	511 (41.7)	2165 (43.1)	2118 (41.3)	2293 (37.6)	2669 (37.1)
Roughage	258 (21.1)	1152 (22.9)	1227 (23.9)	1352 (22.1)	1302 (18.0)
Oilcakes	277 (22.5)	963 (19.1)	976 (19.0)	1269 (20.8)	1725 (23.9)
Fishmeal	42 (3.4)	229 (4.6)	238 (4.7)	272 (4.5)	312 (4.3)
Tapioca	42 (3.4)	199 (4.0)	215 (4.2)	356 (5.9)	462 (6.4)
Others	97 (7.9)	308 (6.2)	354 (6.9)	549 (9.1)	733 (10.3)
Total	1227 (100.0)	5016 (100.0)	5128 (100.0)	6091 (100.0)	7203 (100.0)

(Figures in brackets are % of total)

Source: Fachverband der Futtermittel Industrie, Hamburg

The spurt in the proportion of oilcake used in mixed feeds in 1965/66, though it cannot be accepted as being indicative of any trend movement, is likely to continue because of the emerging importance of beef and calves mixed feeds where the proportion of oilcakes is generally high. This is further supported by the decline in the use of grains and of roughage. Notice the growth in the use of fishmeal, both in absolute terms as well as in the proportions used. The same is true of tapioca and the growth in the use of fishmeal, both of which are important in the past few years. Mixed with fishmeal, tapioca (or Manioc) has been found to be a relatively cheap substitute.

Except for co-operatives which are large and which manufacture compound mixed feeds, most other manufacturers meet their requirements of oilcakes through the intermediary of the shippers and importing agencies.

The manufacture of compound mixed feeds in West Germany is under strict regulations; these are rather old, the last amendment to the FUTTER MITTELGESETZ of 1926 was in 1951. Under this regulation the manufacturer is required to specify the various ingredients - fats, proteins, vitamins, minerals - etc., the limits for which are set by the above mentioned act.

The large compound feed manufacturers can achieve these with adjustments in their components taking into account changes in prices. Though, as in other European countries, changes in composition because of short term price fluctuations are not possible, the use of the computer in order to achieve the most economic ingredient mix is indicative of the price consciousness of the German Industry.

Livestock
and
Dairy
Products

With the rise in income levels demand for meat and dairy products has been increasing rapidly in West Germany. The E.E.C. policy has been to make the community increasingly self-sufficient in its requirements of these products, the result has been a decline in the import dependence for meat and dairy products.

Production increases of livestock and eggs in West Germany are given in Annexure Table A-I. Annexure Table, J, K & L give these data in terms of high protein consuming animal units. Total high protein consuming animal units increased by 30 per cent over the period 1960 to 1967. Poultry recorded the highest rate of growth - 70 percent. The production increase in hogs of 20 percent and of cattle only 9 percent is discussed below.

A major limiting factor in the growth of cattle for beef in the E.E.C. has been the maintenance of regulated prices for milk and butter, which makes it more profitable for the German farmer to raise cattle for dairy rather than beef. The emergence of a situation where production of milk grows at a faster rate than demand is bound to bring about a revision in policy. At present however this situation continues. The result is that poultry provides an outlet for meat demand. The impact of this may easily be observed from income elasticity of demand for poultry and beef over the decade ending 1961-63, whereas it is as high as 1.2 in the case of poultry, it is 0.5 in beef*. The elasticity of demand for pig meat at 0.3 gives the trends in consumer demand preference pattern for meat in West Germany, as in most other advanced countries pork is a relatively inferior meat in the consumer preference pattern, a rise in incomes leads to increased consumption of meat other than pork.

As against this growth in production, the apparent consumption of the protein content of high protein cake and meals more than doubled from 0.7 million tons in 1960 to 1.7 million tons in 1966. The result is that consumption of

* Income elasticity may be simply explained as being the change in demand for a product for one unit change in income. In this case poultry being more easily available, a unit increase in income results in an increase in demand higher than the change in income.

protein in the form of high protein feed stuffs per animal unit increased by 80 percent between 1960 and 1966. This increase is most unusual considering the levels in the U.S.A. and other North European countries. Absolute variations in consumption of oilcakes and meals in different countries must, however take account of several factors e.g. availability of large farm produce like grains, potatoes, legumes, alfalfa, milk etc. and pasture land as in the U.S.A. However, this expansion in West Germany may be explained as being the result of several factors, the most important of which are: (1) the relatively high grain prices in the E.E.C. as a whole and more particularly West Germany until the Common Agriculture Policy became effective in the E.C.M. from July 1st 1967. (2) the high proportion of direct feeding in West Germany even at present as compared to the use of mixed compound feeds, (3) the relatively high proportion of oilcakes that the German farmer has been historically accustomed to, (4) the relative length and severity of the winter in Germany as compared to say the U.K. and the U.S.A., and (5) the relatively lower proportion of pasture and other farm by-products available to the German livestock producer than what is available to his British and U.S. counterpart.

Until July 1967, prices of grains varied widely as between different member countries. Until this date, it will be observed that West Germany imposed the highest levy of import duties on barley for feed, this made the free imports of oilcakes and fish meal highly competitive. Annexure Table IV shows the relative prices of three coarse grains in some countries of the E.C.M., the U.S.A. and U.K. Prices of barley and oats were much higher than in France. As compared to the U.S. prices were generally twice or more in West Germany. These price differences certainly made the use of oilseed cake and meal relatively cheaper than in the U.K., and the U.S.A.

Again, in spite of the rapid growth of the compound feed manufacturing industry, consumption of the product per animal is still well below that in other advanced countries. In 1965, for example, consumption of compound feedstuffs per animal was 421 kgs. in case of cattle in West Germany as against 1354 in Netherlands and 888 in Belgium; it was much lower though in France and Italy - 200 and 165 kgs. only. In the case of hogs, consumption of mixed feeds per hog for West Germany, Netherlands, Belgium,

France and Italy were 105, 551, 501, 153 and 92 kgs. in 1965. Taking into account apparent consumption of protein, this is clearly indicative of the extent of direct feeding of oilcakes in the different countries. As mentioned above, the relative competitiveness of oilcake vis-a-vis grain in the E.E.C. is historically the outcome of a drive towards self-sufficiency in food grains. The impact of this relative competitiveness may be realised from the steep increase in feeding coarse grains in late 1967 and 1968 because of increased production of grains all over Europe. In a small farm enterprise, as in Germany, even a small variation in relative prices will make the farmer use his own farm produce, in this case grains, rather than buy his requirements from other sources.

It must be emphasised, however, that with a decline in grain prices relative to those of oilcakes a cut in per animal unit consumption of the latter seems inevitable in Germany especially and to a lesser extent in other E.E.C. countries. Again, it appears that consumption of oilcakes per animal unit in West Germany has far exceeded the optimum level taking for standards European countries like Netherlands, U.K., Sweden and Denmark. Between 1960 and 1966, of the total apparent

increase in high protein oilcakes and fishmeal consumption, the increase in per animal unit consumption accounted for almost 75 percent. This situation is most unlikely to continue. In fact one may more confidently expect a decline in the per animal unit consumption of oilcakes and meal.

On the basis of an assumed constancy in the amount of oilcake consumed per animal unit in 1966, Germany would require 5.4 million tons of cake (44% protein equivalent) if production of livestock and eggs, (as shown in Annexure Table II) materialise on the basis of meat production projected by the F.A.O. West German consumption of oilcakes would increase by 44 percent between 1966 and 1975, or by slightly less than 5 percent per annum. Since Germany produces only rapeseed of limited quantities and this production is not likely to increase, almost the entire increase in oilcake consumption would have to come by way of imports. Domestic crushing margins are by no means favourable. In addition to heavy stocks of butter, the problem of disposal of vegetable oils and fats is acute enough to prevent any large scale expansion in crushing. This does not rule out the increased

crushing of soya at the cost of other tropical oilseeds. As observed in the section dealing with production of oilcakes in West Germany, this trend is clearly evident over the past 7 years. Soyabean having the least oil content has an edge over all other tropical oilseeds in this regard. The very structure of the oilseeds crushing industry in Germany is increasingly being geared in favour of soyabean. A shift from crushing of tropical oilseeds with a high oil content to soyabeans with low oil content would mean that given no change in crushing capacity, more cake would be available from the domestic crush. To this extent imports of other oilcakes would grow at a lower rate. Yet another factor that would have to be reckoned with is the uncertain supply of sunflower seed oil from the U.S.S.R.

In conclusion, it may be said that the West German market for oilcakes will grow at the rate of about 5 percent per annum.

Oilcake Imports
of Direct
Interest to
India:

Though oilcakes of different types are competitive, it must be recognised that some have characteristics that make them better suited in particular end-uses than others, not to mention the consumer bias. It is, therefore, useful to examine trends

in imports of such oilcakes into West Germany as are at present exported from India. This is not to suggest that Indian oilcakes cannot compete with, say soya or fishmeal. Comparing Indian performance with other competitors with more or less identical products in the West German market is, however, likely to give a clearer picture of the scope for exports from India.

It will easily be observed that the five oilcakes specified in Table 7 account for a large proportion of oilcakes consumption in West Germany. The high import dependence (almost entirely import dependent if cake equivalent of seed is taken into account) gives India large scope for participation in this trade.

Indian participation, however, has been very limited over the 1960's trade in these products with West Germany.

It will be seen that India exported small quantities of peanut and copra cake to West Germany, exports of linseed and cottonseed cake were negligible.

Table 7: WEST GERMANY: CONSUMPTION OF SELECTED OILCAKES
('000 metric tons)

Type of Oilcakes	1966	% of total	1967	% of total
Peanut	207.8	(5.4)	178.3	(5.3)
Rapeseed	112.8	(2.9)	116.0	(3.4)
Cottonseed	214.8	(5.5)	185.2	(5.4)
Linseed	285.1	(7.3)	209.9	(6.2)
Copra	481.2	(12.4)	390.9	(11.5)
Others	2590.7	(66.5)	2321.0	(68.2)
Total	3892.4	(100.0)	3401.3	(100.0)

Source: West Germany - Supply-Distribution Tables.

Table 8: WEST GERMANY: ORIGIN-WISE IMPORTS OF
GROUNDNUT CAKE

• ('000 metric tons)

	1965	% of total	1966	% of total	1967	% of total
Sudan	21.9	(19.5)	17.0	(9.6)	29.0	(20.4)
Senegal	7.1	(6.3)	4.9	(2.7)	4.1	(2.8)
Argentina	23.2	(20.7)	45.9	(25.8)	15.7	(11.1)
Brazil	39.2	(35.2)	63.3	(35.6)	59.1	(41.6)
India	2.7	(2.4)	7.6	(4.3)	7.2	(5.3)
Pakistan	6.4	(5.7)	18.1	(10.2)	5.3	(3.7)
U.S.A.	3.2	(2.9)	7.4	(4.2)	10.9	(7.7)
Others	7.8	(7.3)	13.7	(7.6)	10.5	(7.4)
Total	111.6	(100.0)	177.9	(100.0)	142.2	(100.0)

Source: National Trade Statistics of West Germany

Table 9: WEST GERMANY: ORIGIN-WISE IMPORTS OF LINSEED CAKE

('000 metric tons)

	1965	% of total	1966	% of total	1967	% of total
Argentina	193.3	(67.5)	126.3	(52.8)	99.8	(54.1)
Brazil	6.6	(2.3)	6.3	(2.7)	3.0	(1.6)
U.S.A.	38.2	(13.4)	50.4	(21.1)	41.6	(22.5)
U.A.R.	3.2	(Neg.)	2.1	(Neg.)	Neg.	(Neg.)
Other E.C.M.	31.6	(11.0)	29.8	(12.5)	25.2	(13.7)
Others	13.3	(5.8)	24.2	(10.9)	14.8	(8.1)
Total	286.2	(100.0)	239.1	(100.0)	184.4	(100.0)

Source: National Trade Statistics of West Germany

Note: India's exports of linseed cake to West Germany were 1,500 tons in 1966 and negligible in 1967.

Table 10: WEST GERMANY: ORIGIN-WISE IMPORTS OF COTTONSEED CAKE

('000 metric tons)

	1965	% of total	1966	% of total	1967	% of total
Sudan	124.0	(66.1)	121.8	(56.9)	105.1	(56.6)
Mexico	5.9	(3.1)	7.1	(3.3)	6.1	(3.3)
Argentina	0.6	(Neg.)	10.6	(4.9)	15.9	(8.5)
Brazil	2.5	(1.5)	4.9	(2.3)	9.2	(4.9)
Syria	21.9	(11.7)	20.7	(9.7)	12.5	(6.7)
Pakistan	0.4	(Neg.)	13.4	(6.2)	6.8	(3.7)
U.S.S.R.	-	(-)	1.4	(Neg.)	6.9	(3.7)
Others	32.3	(17.2)	34.1	(15.9)	23.1	(12.4)
Total	187.6	(100.0)	214.0	(100.0)	185.6	(100.0)

Source: National Trade Statistics - West Germany

Note: India's exports of cottonseed cake to West
Germany are negligible

Table 11: WEST GERMANY: ORIGIN-WISE IMPORTS OF COPRA CAKE

('000 metric tons)

	1965	% of total	1966	% of total	1967	% of total
U.S.A.	9.9	(3.1)	16.3	(4.2)	19.5	(6.0)
Indonesia	78.9	(24.6)	87.6	(22.9)	77.9	(24.1)
Philippines	126.7	(39.5)	164.7	(43.0)	141.6	(43.8)
Australia	9.5	(3.1)	11.9	(3.1)	11.4	(3.4)
India	11.5	(3.6)	17.6	(4.6)	5.5	(1.7)
Other ECM*	52.7	(16.2)	55.2	(14.4)	41.2	(12.8)
Total	320.5	(100.0)	382.7	(100.0)	322.8	(100.0)

* Mainly Netherlands

Source: National Trade Statistics - West Germany

In the case of peanut, linseed and cottonseed cakes, it is mainly the Latin American and African countries that participate in the trade with West Germany. In peanut cake, Argentina and Brazil account for well over 50 percent. From the foreign markets survey it was observed that these countries had no advantage in terms of quality, in fact the reputation in terms of quality of cake originating from these countries is not too high. African produce, on the other hand, accounting for a little less than a fourth of total West German peanut cake imports, appears to have a good reputation for supplies of consistent and high quality products. The reason for India being unable to get a bigger share of this market is essentially the price factor; of this more later.

In linseed cake the picture is more or less identical to that in peanut cake, except for the fact that import from other E.C.M. countries is substantial. However, this area has no particular advantage, except of location since imports into the E.C.M. are free.

In cottonseed cake, Sudan is the most important supplier, this cake is generally of a high quality.

The same holds true in the case of the U.S.S.R., cottonseed cake importers have generally been impressed with the quality of this cake. Pakistan has been able to export cottonseed cake in an increasing volume to West Germany, these still constitute a very small proportion of German imports. Quality-wise Pakistani cottonseed cakes do not have an advantage over India.

The combined share of Philippines and Indonesia accounts for two-thirds of total West German copra cake imports. Most of these cakes retain a relatively high proportion of oil (in fact, 4-5 percent). India copra expeller cakes, we were given to understand, compare favourably with this product and hence can find a ready market here. It must be emphasised that this product imports into West Germany have increased very rapidly because it has a certain preference value for the farmer and is to a large extent fed directly.

The countries which formerly supplied West Germany with substantial quantities of oilseeds have performed relatively well in their exports of oilcakes to this country. This is obvious in the case of Brazil, Argentina and to a lesser extent Mexico on the one hand and the African countries on the other. In the case of copra cakes, the Philippines and Indonesia have also been able to fare well on this market.

Factors
Affecting
India's
Exports of
Oilseeds to
West Germany

In so far as peanut cake is concerned, African countries have the advantage of being able to supply expeller cake, which is banned for exports from India. The same is true for cottonseed of which an increasing proportion in Indian exports are extractions. Indian exports of both copra and linseed are in the form of expellers, these compare favourably with the quality supplied by other competing countries.

As in the case of most Continental countries, West German trade with the Latin American countries and Africa is much larger than trade with India, this results in better shipping facilities. Again, the long shipping period especially after the closure of Suez Canal is a disadvantage beyond the control of Indian exporters (In this connection, it must be mentioned that some importers on the Continent were of the opinion that the long shipping period which adds to the element of uncertainty was not a limiting factor, because the shipping contract in the case of India was generally two months.) Germany has bulk unloading facilities at Rotterdam, Hamburg and Bremen. Most of the compound

feed mills are located on wharf sites. Transshipment facilities from Rotterdam and Hamburg have been well developed so that cargo can be transported by lighters to the smaller ports or mill sites. Rotterdam, in fact plays a key role for West Germany, Netherlands and Belgium because of its excellent link to the hinterland for these countries with canals and the Rhine river. Pelletising for bulk shipment is important, the advantage of this has been taken by some countries. The shortage of labour and high wages make bag bleeding and transport costly. Brazil, Argentina, most of the African producers, and of course, the U.S.A. supply their cake in bulk form. It may, however, be noted that some importers in Germany were not adverse to handling of Indian oilcakes even in bagged form.

Like almost all other European countries, German importers buy their cake on c.i.f. terms either through shippers (often use internationally operating shippers who have subsidiaries in various countries viz. European Grain, Bunge, Lever and Rayners, who deal in more than one commodity but mainly restricted to food products). There are also brokers and c.i.f. agents who act as intermediaries and charge a commission. The smaller firms generally charge a brokerage of $\frac{1}{2}$ percent, the bigger

firms charge only $\frac{1}{4}$ percent. Many large exporting firms also have representatives or branch offices in West Germany through whom the transaction is routed by the end user. It may be noted that the import business in oilcakes in West Germany as in other European countries, has tended towards concentration. At present 4-5 importers account for 60-70 percent of the business.

Few compound manufacturers buy their oilcake requirements directly. However, in the case of West Germany, the co-operatives play an important role in supplying their members with mixed feeds and buy oilcakes directly. The two most important of such organisations are

- 1) BAYERISCHE WARENUMMITTLUNG LANDWIRTSCHAFTLICHE -
MUNICH.
- 2) SCHLESWIG - HOLSTEIN LANDWIRTSCHAFTLICHE
HAUPT GENOSSENSCHAFT GMBH, RAIFFEISENSTRASSE 1,
KIEL.

Two types of contract forms are generally used in the transactions for oilcake imports, the most commonly used is the London Cattle Food Trade Association, Contract No.15. West Germany also used the German Cattle

Food Contract No. III. The specifications and trade conditions of the two contracts are more or less identical. The contracts are invariably for future delivery; the period varies as between different supplying countries. Factors affecting transaction, risk insurance, various charges, mode of payment etc. are clearly defined. Payments are usually varying between 96-98 percent on presentation of documents. The place for arbitrations in case of the London CFTA contract is London, the German Food Contract arbitrations are in Hamburg.

West Germany does not have strict administrative restrictions on quality specifications, though there are factors which Indian exporters would need to keep in mind especially based on past practices. West Germany does not impose any quantitative restriction nor does it impose import duty on oilcakes. However, an import duty of 4 percent ad valorem on fishmeal was reduced to 2 percent ad valorem at the Kennedy round of Tariff Negotiations.

One factor that does bother the importer in West Germany is the sanitary conditions of the cargo which is examined at port of delivery and this is of a strict nature. If cargo conditions are unsatisfactory, the importer may have to get it

fumigated at a substantial cost to himself before taking delivery. It has been observed that storage and warehousing conditions at port of embarkation are often unsatisfactory in most under developed countries including minor ports from India. These can result in the importer having to bear substantial cost for which he is rarely compensated.

Summing-up

West Germany is among the largest oilcake and meal markets of the world, consuming a wide range of oilseed cake and meal. For a rapidly expanding live-stock industry, West Germany's demand is increasing by at least 6 percent per annum. At present India hardly participates in this trade. Quality-wise, German importers have few complaints on Indian groundnut extractions.

ANNEXURE TABLE I : WEST GERMANY

Cattle and Hogs on Farms, Production of Eggs and Poultry Meat 1960-65

Particulars	1960	1961	1962	1963	1964	1965	1966
Cattle on Farms (million)	13.1	13.4	14.0	13.7	13.5	13.9	14.3
Hogs on Farms (million)	14.1	15.5	16.2	15.5	17.4	17.1	16.3
Egg - Production (million Dzs.)	653.0	702.0	761.0	833.0	933.0	994.0	1075.0
Poultry Meat - Production (million lbs.)	219.5	239.7	243.6	266.6	313.6	326.0	337.5

Source: Commonwealth Economic Committee, MEAT; DAIRY PRODUCTS, H.M.S.O., London
(various issues)

ANNEXURE TABLE II : WEST GERMANY

High Protein Consuming Animal Units 1950-66 and Projections for 1975

Particular	1950	1961	1962	1963	1964	1965	1966	Projections 1975
Cattle (Million)	6.5	6.7	7.0	6.7	6.7	6.9	7.1	8.6
Hogs (Million)	7.0	7.8	8.1	7.7	8.7	3.5	8.4	9.7
Eggs (Million)	4.7	5.0	5.4	5.9	6.7	7.1	7.7	16.0
Poultry Meat (Million)	1.0	1.1	1.1	1.2	1.4	1.5	1.7	2.6
Totals (Million)	19.2	20.6	21.6)	21.5	23.5	24.0	24.9	36.3

Source: Annexure Table I (See note on methodology for converting livestock into high protein consuming animal units and for projections in Chapter I, Volume II.

ANNEXURE TABLE III : WEST GERMANY

Apparent Consumption of Oilcake Protein per Animal Unit 1960-66 & Projection for 1975

(Including projection for total cake & meal demand)

Particular	1960	1961	1962	1963	1964	1965	1966	Projections	
								1975	
Protein Consumption (1000 tonnes)	733.4	760.5	1042.0	1027.1	1281.6	1386.4	1717.1	2540.0	
Protein Consumption (Million lbs.)	1613.5	1673.1	2292.4	2259.6	2819.5	3050.1	3777.6	5532.0	
Protein Consumption units (Million)	19.2	20.6	21.6	21.5	23.5	24.0	24.9	36.8	189
Consumption per unit (lbs.)	84.0	81.2	106.1	105.1	120.0	127.1	151.7	151.7	1
Consumption per unit (lbs.)	191	184	241	239	273	289	345	345	

Note : Projections : The cake equivalent of 5218 million lbs. of protein is 5.8 million tons
(expressed in 44 per cent protein cake)

/ : In terms of 44% Protein-content

Source : West Germany : Supply-Distribution Table I, Annexure Table II.

ANNEXURE TABLE IV : WEST GERMANY

PRODUCTION OF COMPOUND-MIXED FEEDS (BY MARKETING YEAR, BY LIVE-STOCK GROUPS).

Particular	1961-62 to 1966-67					(in '000 metric tons)
	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67 ⁽¹⁾
Poultry Feed	1931 (41.9)	2118 (42.2)	2338 (45.6)	2585 (42.3)	3047 (42.3)	3235 (42.7)
Hog Feed	1417 (30.8)	1532 (30.5)	1403 (27.4)	1683 (27.5)	2033 (28.2)	2172 (28.6)
Cattle Feed	1157 (25.1)	1250 (24.9)	1272 (24.8)	1676 (27.4)	1937 (26.9)	1963 (25.9)
Other Feed	100 (2.2)	116 (2.3)	115 (2.2)	168 (2.7)	186 (2.6)	209 (2.8)
Total	4605 (100.0)	5016 (100.0)	5128 (100.0)	6112 (100.0)	7203 (100.0)	7579 (100.0)

Source: Fachverband der Futtermittel industrie, Hamburg.

(1) : Partly estimated. Figures in brackets show percentages to actual totals.

Annexure Table IV

WEST GERMANY

Grain Prices in Selected Countries

	<u>West Germany</u>		<u>France</u>		<u>Italy</u>		<u>U.S.A.</u>		<u>U.K.</u>	
	Barley	Oats	Barley	Oats	Maize	Maize	Barley	Oats	Barley	Oats
1960	9.0	8.1	6.7	4.8	6.3	3.8	4.1	3.9	7.9	5.7
1964	9.3	9.4	7.9	6.7	7.4	4.3	4.3	4.6	7.2	6.1
1965	9.8	9.4	8.1	7.2	7.0	4.7	4.3	4.6	6.8	6.5
1966	9.6	9.2	8.2	6.7	7.7	4.9	4.6	5.1	6.8	6.5
1967 Jan-March	9.7	9.0	8.2	6.3	7.7	4.7	4.7	5.0	5.9	6.6
1967-July	8.3	-	8.2	7.3	8.2	4.9	4.6	4.4	5.9	6.2

Source: Monthly Bulletin of Agricultural Economics and Statistics, Vol. 17, No.2

* U.S. Yellow, nearest forward shipment, c.i.f.

Note : Prices are Producer Prices for all countries, except U.K. maize.

4. OTHER WESTERN EUROPE

The group "Other Western Europe", excluding the U.K. and the ECM countries is a heterogenous group in so far as the demand for oilcakes and meal is concerned. In this group lie the most sophisticated and developed livestock producers - viz. Denmark and Sweden and also the least developed in Western Europe, like Finland and Spain. Feeding techniques and livestock breeding differ from country to country, this is easily reflected in the development of the compound feed industry as well as the levels of per capita consumption of meat and dairy products. Nonetheless, these countries are generally deficient in high protein animal feedstuffs and are mainly dependent on imports for their requirements of these products. Their imports which in 1960 accounted for 16.1 percent of World imports of oilcake and meal (including cake equivalent of oilseeds and fishmeal) increased to slightly less than 17.3 percent, by 1967. However, contrary to general trends, especially in the ECM and the U.K., imports of the cake equivalent of oilseeds increased by 155 percent as against a mere 40 percent in the case of oilcakes specifically over the 1960-67 period. The major part of this growth in imports of oilseeds is accounted for by Spain. Imports of oilcakes specifically by Spain declined from 197,000 tons in 1963 to only 21,000 tons in 1967, on the other hand

imports of the cake equivalent of oilseeds increased from only 11,000 tons in 1960 to 706,000 tons in 1967. This sharp upward spurt in Spanish imports resulted in this country becoming the second largest meal market in this region, second only to Denmark with an import level of 12 million tons in 1966. Among the more important markets for oilcakes in this group of countries are Norway and Sweden, Switzerland is emerging as an important importer also. Fishmeal imports in this region also increased very sharply from 102,000 tons in 1960 to 315,000 tons by 1967. Both Norway and Sweden are large producers of fishmeal.

Annexure Tables A to I give data on supply-distribution of oilcake and meal for the group as a whole (i.e. for Austria, Ireland, Denmark, Norway, Sweden, Spain, Switzerland and Finland). Table A clearly shows the limited production of oilseeds in this group of countries. Except for a limited production of cottonseed where output remained stagnant, the only other important oilseed produced is rapeseed. The production of rapeseed increased very rapidly from 88,000 to 280,000 tons over the seven year period 1960 to 1967. As in most other European countries production of rapeseed is encouraged by a price support system. A small quantity of rapeseed is also exported (see Table G).

The imports of oilseeds has undergone a marked change in the composition pattern over the 1960's. Though soyabean, even in 1960 accounted for slightly over 50 percent of oilseeds imports, copra, groundnuts and linseed were imported in substantial quantities and accounted for almost 36 percent of total oilseeds imports. By 1967, soyabeans alone accounted for over 80 percent of total oilseed imports. Imports of groundnuts and linseed remained more or less stable, whilst that of copra actually declined. To some extent, this shift in the pattern of oilseeds imports reflects on the availability of different oilseeds and partly the meal requirements for livestock feed rather than vegetable oil in these countries.

Production of oilcakes accordingly increased very substantially from 640,000 tons in 1960 to 1.5 million tons by 1967. The composition pattern is more or less identical to that of oilseed imports, since domestic production has come to play a decreasingly important role.

In so far as imports of oilcake and meal are concerned, though soyabean meal accounts for over one-third, the spread is over a fairly large number of oilcakes. Imports of cottonseed cake, it will be observed played the most important role between 1963 and 1966, a substantial quantity supplied by Turkey and the African group of countries. The imports of groundnut cake are the third largest

oilcake imports of this region. Groundnut cake imports doubled over the 1960-1967 period. Sunflowerseed cake though it accounts for slightly less than 10 percent of meal imports in 1967 has shown a wide range of variation from 54,000 tons in 1964 to 166,000 tons in 1961. Linseed and copra both show variations and are among the important oilcake imports of this region. As in the case of the ECM countries, other west European countries also, have been undertaking an increasing oilcakes export trade. Oilcake exports consistently increased from 96,000 tons to 231,000 tons over the seven year period 1960 to 1967. Soyabean meal is by far the most important oilcake export and in 1967 accounted for slightly over 80 percent of the total oilcake export from this region.

As remarked earlier, feeding techniques and the degree of development of the livestock industry is by no means uniform in this group of countries. *Pari passu* the mixed feed industry plays a more or less important role in techniques of feeding; trade practices, etc. are dealt with in a few country reports below. As it is the mixed feeds production has made a significant progress in most of the countries as indicated in the table below:

Table 1

Mixed Feeds* Production

('000 metric tons)

	1960	1964	1965
Austria	115	214	279
Denmark	1605	3139	3277
Finland	134	127	130
Ireland	333	597	804
Norway	562	726	816
Spain	400	2800	3000
Sweden	553	750	848
Switzerland	248	430	550
Total	3950	6783	9704

* The term mixed feeds includes both complete feeds (i.e. inclusive of grain) and high protein concentrate mixtures (need to add grain).

Source: Foreign Agriculture Circular; U.S. Dept. of Agriculture,
F.G. 10-67

Given the level of economic development and the extent of livestock population, consumption of meat and dairy products varies as between the different countries. For example, per capita meat consumption was as low as only 23 kgs. in Spain in 1961-63 (average) as against 63 kgs and 56 kgs in Denmark and Austria respectively. With the growth in standards of living demand for meat in this group of countries is bound to grow at an even higher rate than that visualised in the case of the ECM group of countries. In these circumstances production of livestock and livestock products may be expected to grow rapidly. Annexure tabled J, K and L show the growth in production of cattle, hogs, poultry and egg in other Western Europe. In terms of high protein consuming animal units production of livestock increased by 15 percent over the 1960-66 period, the most rapid growth being in the case of poultry and egg. Production of hogs remained more or less stable whilst that of cattle seems to have recently entered into the stage of growth. It must be remembered that as in the case of the ECM countries consumption of beef which has been traditionally low is bound to grow more rapidly over the next few years. Table L shows the growth in consumption of oilcakes per animal unit as having grown very rapidly from 148 lbs. in 1961 to 265 lbs. by 1966. Clearly the present level appears to be on the high side as compared to per animal unit consumption of oilcakes in other advanced

countries. However, as mentioned in the section dealing with the demand for oilcakes, various factors may be responsible for this rapid growth, for example, deficiency of feed grains and hence low protein content materials may have induced these countries to have increased their oilcake protein consumption to the present high level.

WEST EUROPE (AUSTRIA, IRELAND, DENMARK, NORWAY, SWEDEN, SPAIN,
SWITZERLAND, FINLAND)

Table A - Production of Oilseeds

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut ^{u/}	7.1	8.1	10.2	8.1	9.1	8.6	8.6	8.6
Soyabean	-	-	-	-	-	-	-	-
Cottonseed	145.3	212.3	222.5	190.0	162.6	167.0	180.0	125.0
Sunflower seed	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Rape/Mustard	38.2	169.1	225.2	156.2	262.2	266.0	149.0	280.0
Linseed	9.2	9.2	8.3	4.1	5.2	1.9	1.8	1.8
Sesamum	-	-	-	-	-	-	-	-
Palm Kernel	-	-	-	-	-	-	-	-
Copra	-	-	-	-	-	-	-	-
Total	251.8	400.7	468.2	360.4	441.1	445.5	341.4	417.4

^{u/} = unshelled

WEST EUROPE (AUSTRIA, IRELAND, DENMARK, NORWAY, SWEDEN, SPAIN,
SWITZERLAND, FINLAND)

Table B - Imports of Oilseeds

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut ^{s/}	61.8	100.4	112.6	93.2	109.6	111.7	111.1	109.9
Soyabean	494.2	383.0	511.3	511.3	604.9	922.9	1157.0	1501.3
Cottonseed	-	-	-	-	-	-	-	-
Sunflowerseed	4.0	4.0	5.0	7.0	5.0	1.0	2.2	2.1
Rape/Mustard	7.0	11.0	9.0	4.0	8.0	8.2	12.3	9.1
Linseed	40.2	46.6	45.6	40.0	75.1	53.7	87.2	57.7
Sesamum	14.2	9.1	19.3	6.6	3.2	1.9	3.2	2.2
Palm Kernel	22.1	17.1	21.1	22.1	25.1	20.1	24.1	15.1
Copra	190.5	190.3	128.2	152.2	145.4	153.0	164.5	135.6
Others	-	-	-	-	-	-	-	-
Total	834.0	761.5	852.1	836.4	976.3	1272.5	1561.6	1833.0

^{s/} = shelled

WEST EUROPE (AUSTRIA, IRELAND, DENMARK, NORWAY, SWEDEN, SPAIN,
SWITZERLAND, FINLAND)

Table C - Exports of Oilseeds

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut ^{s/}	-	-	-	-	-	-	-	-
Soyabean	-	-	-	-	-	-	-	-
Cottonseed	-	-	-	-	-	-	-	-
Sunflowerseed	-	-	-	-	-	-	-	-
Rape/Mustard	40.0	34.0	40.0	81.0	98.0	110.2	48.4	41.5
Linseed	-	-	-	-	-	-	-	-
Sesamum	-	-	-	-	-	-	-	-
Palm Kernel	-	-	-	-	-	-	-	-
Copra	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-
Total	40.0	34.0	40.0	81.0	98.0	110.2	48.4	41.5

^{s/} = shelled

WEST EUROPE (AUSTRIA, IRELAND, DENMARK, NORWAY, SWEDEN, SPAIN
SWITZERLAND, FINLAND)

Table D - Oilseeds Available for Crushing

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut s/	66.7	106.0	119.7	98.8	115.9	117.7	117.1	115.9
Soyabean	494.2	383.0	511.3	511.3	604.9	922.9	1157.0	1501.3
Cottonseed	145.3	212.3	222.5	190.0	162.6	167.0	180.0	125.0
Sunflowerseed	6.0	6.0	7.0	9.0	7.0	3.0	4.2	4.1
Rape/Mustard	55.2	146.1	194.2	79.2	172.2	164.0	112.9	247.6
Linseed	49.4	55.8	53.9	44.1	80.3	55.6	89.0	59.5
Sesamum	14.2	9.1	19.3	6.6	3.2	1.9	3.2	2.2
Palm Kernel	22.1	17.1	21.1	22.1	25.1	20.1	24.1	15.1
Copra	190.5	190.3	128.2	152.2	145.4	153.0	164.5	135.6
Total	1043.6	1125.7	1277.2	1113.3	1316.6	1605.2	1852.0	2206.3

s/ = shelled

Derived from Tables A, B and C above.

WEST EUROPE (AUSTRIA, IRELAND, DENMARK, NORWAY, SWEDEN, SPAIN,
SWITZERLAND, FINLAND)

Table E - Oilcake Equivalent of Oilseeds Crushed

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	37.3	59.3	67.0	55.3	64.9	65.9	65.5	64.9
Soyabean	390.4	302.5	403.9	403.9	477.8	729.0	914.0	1186.0
Cottonseed	61.0	89.1	93.4	79.8	68.2	70.1	75.6	52.5
Sunflowerseed	4.0	4.0	4.6	6.0	4.6	2.0	2.8	2.7
Rape/Mustard	30.3	80.3	106.8	43.5	94.7	90.2	62.0	136.1
Linseed	31.6	35.7	34.4	28.2	51.3	35.5	56.9	38.0
Sesamum	7.3	4.7	10.0	3.4	1.6	0.9	1.6	1.1
Palm Kernel	11.4	8.8	10.9	11.4	13.0	10.4	12.5	7.8
Copra	66.6	66.6	44.8	53.2	50.8	53.5	57.5	47.4
Total	639.9	651.0	775.8	684.7	826.9	1057.5	1248.4	1536.5

Source : Derived from Table D above.

WEST EUROPE (AUSTRIA, IRELAND, DENMARK, NORWAY, SWEDEN, SPAIN
SWITZERLAND, FINLAND)

Table F - Imports of Oilcakes & Meal

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	114.6	161.7	181.2	208.2	250.4	233.2	252.9	228.7
Soyabean	382.2	282.6	424.6	622.7	659.3	615.9	754.2	596.3
Cottonseed	398.5	381.1	428.2	510.9	517.9	584.9	600.7	470.8
Sunflowerseed	153.3	166.4	130.6	90.6	54.1	80.3	148.7	155.6
Rape/Mustard	20.4	32.3	16.3	14.1	17.1	15.2	29.8	23.0
Linseed	64.7	65.2	53.7	62.6	66.6	74.7	64.2	51.4
Sesamum	1.7	1.8	1.7	1.5	1.5	1.8	7.8	8.8
Palm Kernel	-	-	-	-	-	-	-	-
Copra	64.2	72.9	64.3	75.8	118.7	112.1	83.1	96.8
Others	16.5	8.4	23.2	43.9	41.3	65.4	78.0	75.7
Total	1216.1	1172.4	1328.8	1630.3	1726.9	1783.5	2019.4	1707.1
Fishmeal	101.8	128.9	147.9	193.8	201.2	275.2	283.0	314.7

WEST EUROPE (AUSTRIA, IRELAND, DENMARK, NORWAY, SWEDEN, SPAIN,
SWITZERLAND, FINLAND)

Table G - Exports of Oilcakes & Meal

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	0.5	2.1	4.3	0.8	1.8	2.7	1.2	1.0
Soyabean	79.5	71.7	89.5	97.2	106.3	121.0	111.4	189.0
Cottonseed	2.2	2.2	6.5	7.8	10.4	15.1	15.1	14.1
Sunflower seed	0.2	-	0.9	-	-	-	-	0.4
Rape/Mustard	0.6	-	0.3	-	0.4	-	1.7	1.4
Linseed	0.6	0.4	1.0	0.3	0.6	0.7	2.4	1.1
Sesamum	-	-	-	-	-	-	-	-
Palm Kernel	-	-	-	-	-	-	-	-
Copra	9.2	18.0	20.2	16.3	22.0	20.2	14.7	16.2
Others	2.7	3.5	6.8	7.9	10.7	9.7	8.4	7.7
Total	95.5	97.9	129.5	130.3	152.2	169.4	154.9	230.9

WEST EUROPE (AUSTRIA, IRELAND, DENMARK, NORWAY, SWEDEN, SPAIN,
SWITZERLAND, FINLAND)

Table H - Net availability of Oilcakes and Meal and Net availa-
bility of Fishmeal.

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	151.4	218.9	243.9	262.7	313.5	296.4	317.2	292.6
Soyabean	693.1	513.4	739.0	929.4	1030.8	1223.9	1556.8	1593.3
Cottonseed	457.3	468.0	515.1	582.9	575.7	639.9	661.2	509.2
Sunflowerseed	157.1	170.4	134.3	96.6	58.7	82.3	151.5	157.9
Rape/Mustard	50.1	112.6	122.8	57.6	111.4	105.4	90.1	157.7
Linseed	95.7	100.5	87.1	90.5	117.3	109.5	118.7	88.3
Sesamum	9.0	6.5	11.7	4.9	3.1	2.7	9.4	9.9
Palm Kernel	11.4	8.8	10.9	11.4	13.0	10.4	12.5	7.8
Copra	121.6	121.5	88.9	112.7	147.5	145.4	125.9	128.0
Others	13.8	4.9	21.4	36.0	30.6	55.7	69.6	68.0
Total	1760.5	1725.5	1975.1	2184.7	2401.6	2671.6	3112.9	3012.7
Fishmeal	176.0	179.8	224.0	258.2	267.8	371.4	480.4	387.0

Source : Derived from Tables E, F and G.

WEST EUROPE (AUSTRIA, IRELAND, DENMARK, NORWAY, SWEDEN, SPAIN,
SWITZERLAND, FINLAND)

Table I - Raw Protein Equivalent of Oilcake and Meal (including Fishmeal)

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	78.7	113.8	126.8	136.6	163.0	154.1	164.9	152.1
Soyabean	318.8	236.1	339.9	427.5	474.1	562.9	716.1	732.9
Cottonseed	187.4	191.8	211.1	238.9	236.0	262.3	271.0	208.7
Sunflowerseed	58.1	63.0	49.6	35.7	21.7	30.4	56.0	58.4
Rape/Mustard	18.0	40.5	44.2	20.7	40.1	37.9	32.4	56.7
Linseed	34.4	36.1	31.3	32.5	42.2	39.4	42.7	31.7
Sesamum	3.6	2.6	4.6	1.9	1.2	1.0	3.7	3.9
Palm Kernel	2.0	1.5	1.9	2.0	2.3	1.8	2.2	1.4
Copra	26.7	26.7	19.5	24.7	32.4	31.9	27.6	28.1
Others	5.1	1.8	7.9	13.3	11.3	20.6	25.7	25.1
Fishmeal	114.4	116.9	145.6	167.3	174.1	241.4	312.3	251.5
Total	847.2	830.8	932.7	1101.6	1193.4	1383.7	1654.6	1550.5

Source : Supply-Demand Distribution Tables, Austria, Ireland, Denmark, Norway, Sweden, Spain, Switzerland, and Finland.

WEST (EUROPE, (AUSTRIA, SWEDEN, NORWAY, DENMARK, IRELAND, SPAIN,
FINLAND)

Table J - Cattle and Hogs on Farms, Production of Eggs and
Poultry Meat - 1960-1966.

	1960	1961	1962	1963	1964	1965	1966
Cattle on Farms (million)	19.7	20.2	20.3	19.9	19.9	20.1	20.5
Hogs on Farms (million)	18.6	19.1	20.2	19.8	19.8	20.8	19.6
Egg Production (million dzs.)	917.0	953.0	1018.0	1170.0	1128.0	1119.0	1147.0
Poultry Meat Production (million lbs.)	437.1	520.8	605.3	636.4	723.5	727.7	891.2

Source: See annexure - Table - J for Finland, Austria, Sweden, Norway,
Denmark, Ireland & Spain.

WEST EUROPE (AUSTRIA, SWEDEN, NORWAY, DENMARK, IRELAND, SPAIN,
FINLAND)

Table K - High Protein Consuming Animal Units, 1960-1966.

	1960	1961	1962	1963	1964	1965	1966
Cattle (million)	9.7	9.9	9.9	9.7	9.7	9.9	10.2
Hogs (million)	9.1	9.1	9.9	9.7	9.7	10.3	9.7
Eggs (million)	6.4	6.7	7.2	8.4	8.0	8.0	8.0
Poultry Meat (million)	1.9	2.2	2.7	2.8	3.0	3.3	3.3
Total (million)	27.1	27.9	29.7	30.6	30.4	31.5	31.2

Source: See annexure Table - K for Finland, Austria, Sweden, Norway
Denmark, Ireland & Spain.

WEST EUROPE (AUSTRIA, SWEDEN, NORWAY, DENMARK, IRELAND, SPAIN,
FINLAND)

Table L - Apparent Consumption of Oilcake Protein for Animal Unit,
1960-66.

	1960**	1961	1962	1963	1964	1965	1966
Protein Consumption (¹ 000 tonnes)	847.2	830.8	982.7	1101.6	1198.4	1383.7	1654.6
Protein Consumption (million lbs.)	1863.8	1827.8	2161.9	2433.2	2636.5	3044.1	3640.1
Protein Consuming Units (million)	23.7	28.1	29.7	30.6	30.4	31.5	31.2
Consumption per Unit (lbs.)	79	65	73	78	87	97	117
Oilcake Consumption per Unit (lbs.)	180	148	165	181	197	220	265

** : Excluding Ireland

1 : In terms of 44 percent Protein Content.

Source : Annexure Table-L of constituent countries.

5. DENMARK

Denmark is one of the largest importers of oilcakes. At the same time, Denmark also exports a sizable quantity of oilcakes (167,100 tonnes exports during 1967). Consumption of oilcakes appears to have been more or less stable at around one million tonnes per annum. Table 1 gives the domestic production, imports, exports and net availability of oilcakes for Denmark during the years 1961 to 1967.

Table 1

Denmark: Domestic Production, Imports, Exports and Net availability of oilcakes

(in '000 metric tonnes)

Year	Domestic Production (A)	Imports (B)	Exports (C)	Net availa- bility (A)+(B)-(C)
1960	318.4	712.9	92.5	938.8
1961	264.3	706.6	86.0	884.9
1962	336.9	707.7	120.2	924.4
1963	320.9	751.5	122.1	950.3
1964	323.4	887.0	148.9	1061.5
1965	351.7	874.6	160.1	1066.2
1966	274.9	932.7	141.2	1066.2
1967	386.7	799.8	167.1	1019.4

Source: Denmark: Supply-Distribution Tables

It is seen from the table that domestic production in Denmark is around one-third of the net availability of oilcakes. Domestic production also has reached a stable level, the annual average during 1963 to 1967 being in the region 330,000 tonnes. Denmark produces a limited quantity of rapeseed, varying between 30,000 and 50,000 tonnes per year. Thus the bulk of domestic crush is through the imported oilseeds, of which soyabean alone accounts for about 90 percent.

It is interesting to note that Denmark exports nearly half of its domestic production of soyabean meal and at the same time imports soyabean meal to the extent of twice as much as its exports.

The imports of oilcakes have reached a stable level averaging to about 873,000 tonnes per year during the period 1964 to 1967. The fluctuations in imports are mainly dictated by the variations in supply from the domestic crush.

Cottonseed cake/meal accounted for more than one-third of the total imports of oilcakes by Denmark in 1967; soyabean meal accounted for 27 percent and groundnut and sunflowerseed cake 12 percent each. Table 2 gives the imports of different type of oilcakes.

Table 2

Denmark: Imports of Oilcakes by Type

(in '000 metric tonnes)

Type of Oilcake	1961	1962	1963	1964	1965	1966	1967
Groundnut	56.8	55.4	75.4	105.1	93.7	88.5	99.3
Soyabean	145.9	161.8	166.0	236.7	223.3	265.7	215.7
Cottonseed	295.0	321.6	361.3	377.2	399.2	394.8	289.8
Sunflowerseed	108.3	94.2	56.5	44.4	50.4	92.2	100.5
Rape/Mustard	12.6	10.0	12.8	14.1	10.1	9.6	11.6
Linseed	26.6	19.9	19.4	26.6	30.6	25.3	19.5
Copra	55.5	39.6	52.8	79.8	65.7	50.3	60.2
Others	5.0	5.2	7.3	3.1	1.6	6.3	3.2
Total	706.6	707.7	751.5	887.0	874.6	932.7	799.8

Source: Denmark: Supply Distribution Tables

It is observed that the imports of groundnut cake and soyabean meal only increased during 1960 to 1967; imports of cottonseed, on the other hand, showed an increase upto 1965 but have declined, thereafter.

Tables 3 and 4 give the origin-wise imports of groundnut and cottonseed cake/meal. In both these products India's share is low in the trade with Denmark due to the high price of Indian products compared to the price of competitors' products in this market.

Table 3

Denmark: Originwise Imports of Groundnut
Cake/Meal

(in '000 tonnes)					
Origin of import	1962	1963	1964	1965	1966
Argentina	22.6	28.8	37.7	25.9	39.7
Senegal	0.7	11.0	28.7	52.2	18.2
Nigeria	4.3	3.1	1.6	3.9	8.2
Brazil	2.2	8.4	1.9	17.7	4.2
India	1.1	2.5	4.0	-	3.6
Other countries	24.5	21.6	31.2	24.0	14.6
Total	55.4	75.4	105.1	93.7	88.5

Source: Maandstatistiek Van de in-uit-en Doorvoer

Table 4

Denmark: Originwise Imports of Cottonseed
Cake/Meal

Origin of import	(in '000 tonnes)				
	1962	1963	1964	1965	1966
Argentina	17.1	26.9	29.0	18.5	10.5
Gautemala	6.3	9.5	12.4	15.6	12.8
Mexico	31.9	18.4	34.4	35.5	4.4
U. S. A.	35.6	54.4	44.2	102.0	34.4
Uganda	-	-	14.7	14.7	17.2
Kenya	-	-	4.4	3.7	13.6
Elsalvador	22.2	16.3	16.6	25.9	16.2
Tanzania	-	-	11.4	6.3	14.7
Turkey	78.4	93.9	83.5	66.8	82.4
Iran	26.9	22.9	16.1	17.7	28.1
India	-	2.7	6.2	0.1	4.5
Other countries	73.5	109.0	47.3	48.4	70.1
Total	321.6	361.3	377.2	399.2	394.8

Source: Maandstatistiek Van de-in-, uit-en Doorvoer.

The use of fishmeal in Denmark is on the increase. Table 5 below shows the annual consumption of fish meal and meat and bone meal in Denmark.

Table 5

Denmark: Consumption of Fishmeal & Meat and Bone Meal

Meal Type	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
Fishmeal	38	32	49	58	74	69
Meat & Bone Meal	69	78	96	107	96	98
Total	107	110	145	165	170	167

Source: Landbrugsstatistik, 1966.

No data on the production of compound feeds in Denmark is available. However, it was gathered at the time of the foreign markets survey that 85 percent of production is in the form of concentrates and 15 percent in the form of ready mixed feed.

8. NORWAY

Availability of oilcakes in Norway during 1967 is placed at 267,000 tonnes. A little over half of this was available from imports and the rest from domestic production. Table 1 gives trend in growth of net availability over the period 1961 to 1967. It is seen that during this period the net availability of oilcakes has grown at an average rate of 10 percent per year. Even though both domestic production and imports have increased during this period, the former has increased at a higher rate than the latter.

Table 1

Norway: Domestic Production, Imports, Exports and
Net Availability of Oilcakes

Year	Domestic Production (A)	Imports (B)	Exports (C)	(in '000 tonnes.)	
				Net Availability (A)+(B)-(C)	
1961	69.9	98.1	6.9	161.1	
1962	80.9	138.2	1.5	217.6	
1963	77.5	145.8	4.8	218.5	
1964	114.9	133.8	1.8	246.9	
1965	121.2	139.6	4.6	256.2	
1966	139.4	153.7	3.4	289.7	
1967	143.4	161.4	37.5	267.3	

Source: Norway - Supply Distribution Tables.

The entire oilseeds processing industry in Norway is dependent on imported oilseeds. Soyabean meal accounts for nearly 90 percent of the domestically produced cakes.

Imports of oilcakes after a spurt over 1961-62 were, more or less stable at a level of about 140,000 tonnes per year upto 1965. Thereafter, they once again increased to 161,400 tonnes in 1967. Imports consist mainly of expeller cakes - cottonseed, groundnut and sunflowerseed. In 1967, nearly three-fourths of the total imports were of expeller variety. Type-wise imports of oilcakes for the period 1961 to 1967 are given in Table 2, below.

Table 2

Norway: Imports of Oilcakes by Type

Type of cake	(in '000 tonnes)						
	1961	1962	1963	1964	1965	1966	1967
Copra	4.6	7.3	4.7	0.3	5.1	-	-
Cottonseed	-	9.1	27.0	27.8	38.1	51.3	51.1
Groundnut	36.2	58.6	59.3	69.8	49.6	44.7	34.5
Linseed	10.6	8.6	11.2	11.3	11.9	11.4	8.2
Soyabean	6.4	24.0	20.7	8.8	-	3.1	-
Sunflowerseed	31.6	18.6	3.2	-	9.0	25.0	26.1
Others	8.7	12.0	19.7	15.8	25.9	21.3	41.5
Total	98.1	138.2	145.8	133.8	139.6	153.8	161.4

Source: Norway - Supply Distribution Tables.

It is seen from Table 2 that groundnut was the major cake imported upto 1965, but cottonseed cake has overtaken it since 1966. In fact, imports of cottonseed cake have increased from practically nil in 1961 to 51,100 in 1967. We are given to understand that imports of groundnut cake have been curtailed mainly on account of difficulties experienced in finding suppliers of required quality of expeller cake at competitive prices.

Imports of soyabean meal have been conspicuously absent in the recent past due to its increased supplies from the domestic crushers.

Sunflowerseed expeller cake is entirely imported from the U.S. S.R. Fire hazards in storage of sunflowerseed cake are likely to result in its imports being prohibited into Norway.

Tables 3 and 4 give origin-wise imports of groundnut and cottonseed cake for the period 1965 to 1967. It is seen that in 1965 Norway used to import groundnut cake from over half-a-dozen countries, during the last two years, however, imports have been mainly from Senegal and S. Domingo.

Turkey is the largest supplier of cottonseed expeller cake to Norway. Other countries which supply small quantities include Argentina, Iran and the U.S.A.

Exports of oilcake from Norway were negligible until 1966, but, in 1967 there has been a sudden spurt and exports jumped to 37,500 tonnes.

Table 3

Norway: Origin-wise Imports of Groundnut Cake

('000 tonnes)			
Origin of import	1965	1966	1967
S. Domingo	-	15.3	21.4
Senegal	25.3	23.1	13.1
Nigeria	14.9	-	-
Argentina	2.0	6.3	-
Other countries	7.4	-	-
Total	47.6	44.7	34.5

Source: The Annual Reports for 1965, 1966, and 1967.
The Norwegian Grains Corporation.

Table 4

Norway: Origin-wise Imports of Cottonseed Cake

(in '000 tonnes)			
Origin of import	1965	1966	1967
Turkey	21.5	35.6	31.4
Argentina	8.1	2.1	9.1
Iran	1.0	4.4	5.6
U.S.A.	6.2	7.1	-
Others	1.3	2.1	5.0
Total	38.1	51.3	51.1

Source: The Annual Reports for 1965, 1966 and 1967.
The Norwegian Grains Corporation.

The Norwegian Grains Corporation, is the sole importer of oil-cake in Norway. This organisation has been set up at the instance of Norwegian parliament and is given monopoly rights to import as well as to buy from the domestic manufacturers such qualities of animal feed stuffs as are required for use within the country. All imports are made through agents.

The Norwegian Grains Corporation, we were given to believe in the course of foreign markets survey, is willing to develop oilcake trade with India. It would be prepared to transact business with Indian exporters directly, if necessary.

The LCFTA Contract No. 15 is used for imports of all oilcakes except for groundnut expellers from S. Domingo for which the 'Scandinavian C.I.F. Contract, 1958' is used. Majority of the contracts are made on the basis of c.i.f. Norwegian ports or the German port of Hamburg.

Norway imports her oilcakes entirely in bulk form. S. Domingo which does not have bulk handling facilities manages to supply in bulk form by bleeding the bags in the holds of ships.

There are no duties on grain imports and feeding stuffs.

The Norwegian Grains Corporation prefers to have expeller cake having minimum 4 percent fat content. The general quality specifications for different types of cake are as follows:

Groundnut Expeller:

O & A : Minimum 54 percent with minimum 4 percent fat.

Fibre : Not specified but as low as possible

Cottonseed expeller:

O & A : Minimum 45 percent with minimum 4 percent fat.

Table 5 below gives the production figures of compound feeds in Norway for the period 1963 to 1967. It is seen that during this period production has increased at an average rate of 12 percent per year from 671,000 tonnes in 1963 to 1,012,000 tonnes in 1967. There are nearly 40 compound feed manufacturing units in Norway.

Table 5

Norway: Production of Compound Feeds

Type of feed	(in '000 tonnes)				
	1963	1964	1965	1966	1967
Cattle	283	299	346	395	450
Pigs	206	232	258	256	293
Poultry	165	176	191	203	233
Others	17	19	21	31	36
Total	671	726	816	885	1012

Source: The Norwegian Grains Corporation.

3. SWEDEN

Demand for oilcakes has been increasing steadily in Sweden over 1960-67. Imported oilcakes account for around $\frac{3}{4}$ of the oilcake requirements of Sweden. Domestic processing industry accounts for $\frac{1}{4}$ of demand. It will be observed that oilcake imports have increased more rapidly than has domestic production. Table 1 below gives the trend in domestic production, imports and exports of oilcakes for the period 1961 to 1967.

Table 1

Sweden: Domestic Production, Imports, Exports and
Net Availability of Oilcakes

Year	Domestic Production (A)	Imports (B)	Exports (C)	Net Availability (A)+(B)-(C)
1961	91.0	222.1	2.7	310.4
1962	82.8	239.6	1.1	321.3
1963	61.9	263.6	2.6	322.9
1964	92.1	321.1	0.7	412.5
1965	87.1	380.3	0.6	466.8
1966	61.0	425.5	2.8	483.7
1967	128.0	333.8	0.3	511.5

Source: Sweden: Supply-distribution
Tables.

Net availability of oilcakes was stagnant at the level of 320,000 tonnes per year during the period 1961 to 1963 but has, thereafter increased steadily to the level of 511,500 tonnes in 1967. This indicates an average growth rate of 14 percent per annum during 1964 to 1967.

The production figures show that during the period 1961 to 1967 supply from domestic sources has been fluctuating between 60,000 and 90,000 tonnes per year. In 1967, however, there was a sudden jump in the domestic production when it moved upto 128,000 tonnes. This increase in 1967 has mainly come about on account of the increased crushing of domestically produced rapeseed which largely reflects the present thinking of Swedish authorities of increasing the utilisation of domestically produced raw materials in manufacture of compound feeds.

Imports of oilcakes into Sweden were increasing upto 1966, when the imports stood at 425,500 tonnes indicating nearly a two-fold increase over that of 1961; in 1967 this growth was arrested and the imports slided back to 1965 level. This drop, it is seen, has mainly come about because of the increased supply from domestic production during 1967.

Soyabean meal and cottonseed cake form the bulk of the oilcakes imported by Sweden; imports of these two oilcakes together accounted for 72 percent of the total imports of oilcakes in 1967. Except for

soyabean meal, oilcakes imported by Sweden are mainly of the expeller variety. In particular, expellers form 90 percent of groundnut cake imports and 100 percent of cottonseed cake.

Table 2 shows the trend in import of different type of oilcakes into Sweden for the period 1961 to 1967. There has been, more or less, no change in the composition pattern of oilcake imports into Sweden.

Table 2

Sweden: Trend in imports of different type of oilcakes

	1961	1962	1963	1964	1965	1966	1967
Groundnut	36.9	36.9	43.2	44.5	53.8	65.8	47.1
Soyabean	93.0	106.7	114.9	148.0	168.4	184.8	173.1
Cottonseed	57.7	64.0	78.9	88.1	110.8	113.5	103.2
Sunflowerseed	9.7	5.2	4.5	0.5	4.2	14.9	18.1
Rape/Mustard	10.0	5.8	0.6	0.4	-	12.1	5.2
Linseed	1.5	2.9	3.0	2.7	3.7	2.4	2.1
copra	12.8	16.9	17.1	35.5	39.1	30.9	34.6
Others	0.5	1.2	1.6	1.4	0.3	2.8	0.4
Total	222.1	239.6	263.6	321.1	380.3	425.5	383.8

Source: Supply Distribution Tables, Sweden.

Sweden exports of oilcakes are of very negligible quantity and they have never exceeded 3,000 tonnes during the period 1961 to 1967.

Import of Fishmeal has also increased in line with the increase in imports of oilcakes; the increase being from 38,800 tonnes in 1961 to 58,100 tonnes in 1967,

Production of compound feeds in Sweden has increased from 666,700 tonnes in 1962-63 to 1,080,400 tonnes in 1966-67 indicating an average rate of increase of 12 percent per year. Table 3 gives production of compound feeds during the period 1962-63 to 1966-67.

Table 3

Sweden: Production of Compound Feeds

	(in '000 tonnes)				
Type of feed	1962-63	1963-64	1964-65	1965-66	1966-67
Poultry	298.9	334.4	357.3	360.0	380.4
Furred animal	6.3	8.6	9.9	14.7	18.0
Others	361.5	415.3	490.8	578.7	682.0
Total	666.7	758.3	857.7	953.4	1,080.4

Source: Department of Agriculture, Sweden.

The cooperation organisation in Stockholm (Svenska Lantmannens Laksforland - SLR) is the largest importer of oilcakes and the largest

producer of compound feeds. Under SLR there are twelve factories manufacturing about 80 varieties of compound feeds for poultry, pigs, cattle, horses and other animals. There is another organisation called Fores & Co., which also produces large quantities of animal feed.

The production, trade and quality of compound feed is controlled by the Government. The Government inspectors visit the plants for surprise checking.

The study of various uses of oilcakes reveals that about 60 percent of oilcakes are utilised for the production of oilcakes mixtures. Another 30 percent are used for the manufacture of compound feeds and the rest is consumed directly.

The content of oilcakes in the compound feeds averages around 17 percent in poultry feeds, 10 percent in hog feeds and 30 percent in cattle feeds. The average composition of compound feeds for the year 1966-67 has been as follows:

<u>Item</u>	<u>Percent Content</u>	
	<u>Poultry feeds</u>	<u>Other feeds</u>
Grain	48.8	50.0
Rape/Wheat	11.0	13.0
Bran etc.	3.3	5.8
Oilcakes	17.3	19.7 (10.0 swine 29.7 cattle)
Fishmeal	5.2	3.5 (6.7 swine 0.3 cattle)
Alfalfa meal	4.2	1.2
Others	<u>10.2</u>	<u>5.8</u>
	100.0	100.0
	=====	=====

Source: Department of Agriculture, Sweden.

Considering the high preference for expeller cakes in Sweden, Indian exports of groundnut extraction are not likely to increase substantially in the near future. However, there is some possibility of selling Indian cottonseed expellers. But this can be achieved only with great efforts in view of the factors enumerated below.

- a) Some Swedish manufacturers of compound feed think that the quality of Indian oilcake is not consistent and is inferior to the cakes supplied by competing countries.
- b) Prices of Indian cottonseed expellers are higher on c.i.f. basis compared to other countries. The price quoted for August/September 1968, delivery c.i.f. Stockholm, was U.S. \$ 98 per tonne. Indian exporters ask for extra charges for quoting prices on the basis of c.i.f. Swedish ports. This puts Indian price out of line with that of competitors.
- c) Trading practices of some of the Indian traders have made a poor impression on the business community in Sweden.
- d) The absence of bulk-handling facilities may also come in the way of increasing oilcake exports to Sweden.

To create better understanding between Indian and Swedish business communities, a non-profit service organisation of Sweden, called 'AB SUKAB' has entered into an agreement with the STC of India. The STC/SUKAB agreement was made in 1963 and since then attempts are being

made by SUKAB to enhance trade facilities between the two countries. Under this agreement the contracts made between the Swedish importers and Indian exporters have to be approved by STC and SUKAB, and the contracts concluded have to be within the frame-work of the STC/SUKAB agreement.

8. EASTERN EUROPE

The East European countries, excluding the U.S.S.R., have in the last few years tended to become an important market for high protein animal feedingstuffs. The main reason for this expansion of the high protein feedstuffs market is the growth in production of livestock and livestock products. With the change in the economic policy on consumption, a rapid growth in production and consumption of meat and dairy products has occurred. In regard to consumption of such food items, Eastern Europe may be said to be at that stage where Western Europe was a decade ago. As in the case of the West European countries, this region is also deficit in animal feedstuffs. Though the U.S.S.R. is a major producer of high protein oilcake, her own requirements do not allow for any large-scale exportable surplus. Hence the East European countries have to look to imports to meet their requirements. A further factor which makes the prospects for imports of oilcakes bright in this region, is the adoption of improved feeding techniques in the form of compound feedstuffs. Production of compound feedstuffs has made rapid strides over the past few years. Rough data on the industry indicate that the utilisation of oilcakes as a proportion in feedstuffs is relatively far lower than in the case of the advanced countries of Western Europe.

As we mentioned earlier, the data on East European trade in this commodity is not readily available. Often, we have had recourse to estimates and pooling of information from different sources. Needless to add, the paucity of data in this regard is fairly well-known. As an example, one can cite the non-availability of import data in the case of East Germany. Therefore, the combined supply distribution analysis for East European countries should be used more as an indicator of growth and change rather than accuracy in data at a point of time.

Imports of oilcakes and meal, (including cake equivalent of oilseeds plus fish meal) increased from around 680,000 tonnes in 1960 to over 1.2 million tonnes in 1966 for six East European countries (Poland, Hungary, Yugoslavia, Czechoslovakia, East Germany and Bulgaria). Of these, the most important is Czechoslovakia accounting for almost 25 per cent of the total imports of this region. Poland, Hungary, and East Germany each account for around 20 per cent of total imports. Imports of fishmeal, included in the above figures, increased from 68,000 tonnes in 1961 to 340,000 tonnes in 1967. Imports of fishmeal are more important in the case of East Germany (35 per cent of the imports for the region), followed by Czechoslovakia and Poland each accounting for around 80,000 to 85,000 tonnes in 1967.

The supply-distribution tables in the annexure give data for seven East European countries. Table 'A' shows the production of oilseeds in this region as having increased from around 1.7 million tonnes in 1960 to 2.4 million tonnes in 1966. Sunflowerseed is by far the most important oilseed produced in this region accounting for slightly over 60 per cent of the total oilseeds produced. Rapeseed is the second most important oilseed, accounting for around 25 per cent of the total oilseeds output. The production of both sunflower and rapeseed has increased in line with total production. Production of linseed in the East European countries has been more or less stagnant at around 100,000 tonnes per annum. Production of castorseed, soyabean and cottonseed is relatively unimportant. The East European countries undertake very little import of oilseeds as such. Over the period as a whole the import of oilseeds decreased between 1960 and 1962 and, thereafter, tended to stagnate at the level of 325,000 tonnes per annum. As regards the pattern of oilseed imports, no trends are observed. There have been marked variations from year to year for different oilseeds. Exports of oilseeds show an uptrend in the case of sunflowerseed but here again variations over the period do not allow for a conclusive analysis.

Table E shows the apparent production of oilcakes in the East European countries. Between 1960 and 1964 there is hardly any change

in the production of oilcakes. Since 1965, however, there has been a sharp upward spurt in the production of oilcakes. This upward spurt is mainly an outcome of increased production of rapeseed and sunflower-seed in these countries. Production of oilcakes in the East European countries followed a pattern more or less identical to that of production of oilseeds.

Imports of oilcake into the East European countries are shown in supply-distribution Table F., Table F shows that imports of oilcakespurted up from 371,000 tonnes in 1962 to 831,000 tonnes in 1964. Thereafter, ~~these have~~ declined to a level 717,000 in 1966.

On the basis of computed net availability of oilcakes in these countries we find that oilcake consumption per animal unit is relatively far lower about 90 lbs. as against an average of over 200 lbs. per animal unit in the advanced countries as a whole.

The country reports indicate that in most East European countries, imports of oilcakes from non-bilateral trade partners tends to be of low order. India appears to be the most important country supplying oilcakes to this region. Imports of soyabean meal from the U.S.A. have picked up very rapidly in the past two years, especially in the case of Poland, Hungary and Yugoslavia, the figures for which in 1967 were 66,000, 67,000 and 145,000 tonnes respectively. Considering that the development of the livestock

industry is concentrated in hogs and, more recently, in poultry, it is evident that Eastern Europe requires to import substantial quantities of the most suitable meal, namely, soyabean. The scope for increased production of milk and dairy products appears to be large. At present the East European countries do not face the problem of surplus of either butter and animal fats or of vegetable oils. This leads us to conclude that, given exchange availability, these countries would necessarily go in for large imports of soyabeans. It is given to understand that groundnut meal imported under bilateral trade, especially from India, is at present used for hog and poultry feed. Already there are complaints on quality. We have pointed out that groundnut meal is by no means the best protein feedstuff in the case of these feeds. Its use has been mainly in the case of cattlefeed. This does not lead to conclude that the scope for groundnut meal is likely to be limited in the next few years. On the contrary, the scope for its utilization in dairy and beef cattle is sufficiently large in order to enable countries like India to step up exports of groundnut meal to a much larger extent in these countries. However, the tendency towards a liberalization of trade policy should make for increased attention to quality of our groundnut meal in order to ensure for its continued growth in this region. In some of these countries, moreover, oilcakes trade is becoming less controlled by state organizations in the sense that the importing agencies are

being granted scope for discrimination in their imports. This trend is bound to make the importers more conscious of price, quality and suitability of meal for particular end-uses. Now that the mixed feed industry is making rapid strides, the quality problem is bound to become more acute.

ANNEXURE 1

Eastern Europe Excluding U.S.S.R. (Bulgaria, Czechoslovakia, Germany D.R.
Hungary, Poland, Rumania & Yugoslavia)

TABLE - A : PRODUCTION OF OILSEEDS

	(in '000 tonnes)						
	1960	1961	1962	1963	1964	1965	1966
Groundnut u/	2.0	2.0	2.0	1.0	1.0	-	-
Soyabean	39.3	16.2	14.1	12.1	14.1	11.1	11.1
Cottonseed	44.1	18.1	33.1	32.1	33.1	32.6	32.6
Sunflowerseed	1031.5	1005.8	1095.5	1198.6	1229.1	1368.2	1505.4
Rape/Mustard	407.4	550.1	587.7	401.6	503.2	797.4	742.5
Linseed	92.9	101.0	104.0	107.0	94.9	144.0	129.2
Sesamumseed	-	-	-	-	-	-	-
Palm Kernel	-	-	-	-	-	-	-
Copra	-	-	-	-	-	-	-
Total	1617.2	1693.2	1836.4	1752.4	1875.4	2353.3	2420.8

Eastern Europe Excluding U.S.S.R. (Bulgaria, Czechoslovakia, Germany D.R.
Hungary, Poland, Rumania & Yugoslavia)

Table - B: Import of Oilseeds

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnuts	38.1	77.3	87.2	93.4	88.5	85.0	85.6
Soyabean	142.6	66.4	38.1	55.3	59.2	115.5	78.8
Cottonseed	22.0	28.0	10.0	32.0	15.0	25.0	25.0
Sunflowerseed	47.0	48.0	46.0	67.0	78.0	65.0	59.0
Rape/Mustard	2.0	2.0	4.0	14.1	24.4	54.7	11.0
Linseed	37.3	45.3	37.4	58.3	35.3	62.1	49.6
Sesamum	4.0	3.0	-	1.0	3.0	2.0	2.0
Palm Kernel	33.4	16.2	21.3	18.3	14.2	29.1	6.3
Copra	10.1	7.0	14.2	13.1	13.1	12.1	12.1
Total	336.5	293.2	258.2	352.5	330.7	450.5	329.4

Eastern Europe Excluding U.S.S.R. (Bulgaria, Czechoslovakia, Germany D.R.
Hungary, Poland, Rumania & Yugoslavia)

TABLE - C : EXPORTS OF OILSEEDS

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut s/	1.0	-	-	4.0	-	-	-
Soyabean	-	-	-	-	-	-	-
Cottonseed	12.0	5.0	5.0	5.0	5.0	5.0	5.0
Sunflowerseed	113.0	97.0	118.0	61.0	141.0	146.0	207.4
Rape/Mustard	1.0	3.0	26.3	8.1	6.0	44.7	87.1
Linseed	-	-	-	-	-	-	-
Sesamum seed	-	-	-	-	-	-	-
Palm Kernel	-	-	-	-	-	-	-
Copra	-	-	-	-	-	-	-
Total	127.0	105.0	149.3	78.1	152.0	195.7	299.5

Eastern Europe Excluding U.S.S.R. (Bulgaria, Czechoslovakia, Germany D.R.
Hungary, Poland, Rumania & Yugoslavia)

TABLE - D : OILSEEDS AVAILABLE FOR CRUSHING

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut s/	39.1	79.3	89.2	90.4	89.5	85.0	85.6
Soyabean	181.9	82.6	52.2	67.4	73.3	126.6	89.9
Cottonseed	54.1	41.1	38.1	59.1	43.1	52.6	52.6
Sunflowerseed	965.5	956.8	1023.5	1204.6	1166.1	1287.2	1357.0
Rape/Mustard	408.4	549.1	565.4	407.6	521.6	807.4	666.4
Linseed	130.2	146.3	141.4	165.3	130.2	206.1	178.8
Sesamum seed	4.0	3.0	-	1.0	3.0	2.0	2.0
Palm Kernel	33.4	16.2	21.3	18.3	14.2	29.1	6.3
Copra	10.1	7.0	14.2	13.1	13.1	12.1	12.1
Total	1826.7	1881.4	1945.3	2026.8	2054.1	2608.1	2450.7

Source : Derived from tables A, B & C.

Eastern Europe Excluding U.S.S.R. (Bulgaria, Czechoslovakia, Germany D.R.
Hungary, Poland, Rumania & Yugoslavia)

TABLE - E: OILCAKE EQUIVALENT OF OILSEEDS CRUSHED

(In '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	21.8	44.4	49.9	50.6	50.1	47.6	47.9
Soyabean	143.7	65.2	41.2	53.2	57.9	100.0	71.0
Cottonseed	22.7	17.2	16.0	24.8	18.1	22.0	22.0
Sunflowerseed	646.8	641.0	685.7	807.0	781.2	862.4	909.1
Rape/Mustard	224.6	30.20	310.9	224.1	286.8	444.0	366.5
Linseed	83.3	93.6	90.4	105.7	83.3	131.9	114.4
Sesamum seed	2.0	1.5	-	0.5	1.5	1.0	1.0
Palm Kernel	17.3	8.4	11.0	9.5	7.3	15.1	3.2
Copra	3.5	2.4	4.9	4.5	4.5	4.2	4.2
Total	1165.7	1175.7	1210.0	1279.9	1290.7	1628.2	1539.3

Source : Derived from Table 'D'

Eastern Europe Excluding U.S.S.R. (Bulgaria, Czechoslovakia, Germany D.R., Hungary, Poland, Rumania, Yugoslavia.)

TABLE - F : IMPORTS OF OILCAKES & MEAL

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	-	-	255.3	357.0	505.0	451.1	387.3
Soyabean	-	-	39.0	60.5	171.3	168.1	161.1
Cottonseed	-	-	34.1	51.3	83.1	108.0	112.5
Sunflowerseed	-	-	18.4	17.4	33.3	26.4	9.5
Rape/Mustard	-	-	0.5	-	1.0	2.5	-
Linseed	-	-	18.9	13.5	19.6	7.8	8.8
Sesamum	-	-	-	-	-	-	-
Palm Mernel	-	-	-	-	-	-	-
Copra	-	-	0.7	-	0.2	-	0.1
Others	-	-	4.2	3.9	17.9	33.7	37.4
Total	-	-	371.1	503.6	831.4	797.6	716.7

Eastern Europe Excluding U.S.S.R. (Bulgaria, Czechoslovakia, Germany D.R.
Hungary, Poland, Rumania, & Yugoslavia)

TABLE - G : EXPORTS OF OILCAKES & MEALS

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	-	-	-	6.5	0.7	-	-
Soyabean	-	-	-	-	-	-	-
Cottonseed	-	-	10.0	20.2	22.2	28.0	28.0 ^c
Sunflowerseed	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-
Sesamum seed	-	-	-	-	-	-	-
Palm Kernel	-	-	-	-	-	-	-
Copra	-	-	-	-	-	-	-
Others	-	-	2.6	3.3	2.7	2.3	2.3 ^c
Total	n.a.	n.a.	12.6	30.0	25.6	30.3	30.3

n.a. = Not available

Eastern Europe Excluding U.S.S.R. (Bulgaria, Czechoslovakia, Germany D.R.
Hungary, Poland, Rumania & Yugoslavia)

TABLE - H: NET AVAILABILITY OF OILCAKES & MEALS &
NET AVAILABILITY OF FISH MEAL

(in '000 tonnes)

	1960*	1961*	1962	1963	1964	1965	1966
Groundnut	21.3	43.9	304.8	400.8	554.1	498.5	435.1
Soyabean	143.4	65.0	79.9	113.5	228.9	267.8	231.8
Cottonseed	22.6	17.1	40.0	55.8	78.9	102.0	106.5
Sunflowerseed	646.6	640.8	704.0	824.3	814.3	888.6	909.0
Rape/Mustard	224.4	301.8	311.3	225.1	287.6	446.3	366.3
Linseed	83.1	93.3	109.2	119.1	102.6	139.4	123.0
Sesamum	2.0	1.5	-	0.5	1.5	1.0	1.0
Palm Kernel	17.2	8.3	11.0	9.4	7.3	15.0	3.2
Copra	3.4	2.4	5.2	4.5	4.7	4.1	4.2
Others	-	-	1.6	0.6	15.2	31.4	35.1
Total	1164.0	1174.1	1566.4	1753.6	2095.1	2394.1	2212.5
Fishmeal	34.6	68.2	152.9	199.1	253.9	302.7	319.1

Source : Derived from Tables E, F & G.

* Figures for this years relate to domestic production only.

Eastern Europe Excluding U.S.S.R. (Bulgaria, Czechoslovakia, Germany D.R., Hungary, Poland, Rumania & Yugoslavia)

TABLE - I : RAW PROTEIN EQUIVALENT OF OILCAKES & MEAL
(INCLUDING FISHMEAL)

(in '000 tonnes)

	1960*	1961*	1962	1963	1964	1965	1966
Groundnut	11.0	22.8	158.5	208.4	288.1	259.2	226.2
Soyabean	66.0	29.9	36.8	52.2	105.3	123.2	106.6
Cottonseed	9.3	7.0	16.4	22.9	32.3	41.8	43.7
Sunflowerseed	239.2	237.1	260.5	305.0	301.3	328.8	336.3
Rape/Mustard	80.8	108.6	112.1	81.0	103.5	160.7	131.9
Linseed	29.9	33.6	39.3	42.9	36.9	50.2	44.3
Sesamum	0.8	0.6	-	0.2	0.6	0.4	0.4
Palm Kernel	3.1	1.5	2.0	1.7	1.3	2.7	0.6
Copra	0.7	0.5	1.1	1.0	1.0	0.9	0.9
Fishmeal	22.5	44.3	99.4	129.4	165.0	196.7	207.4
Others	-	-	0.6	0.2	5.6	11.6	13.0
Total	463.3	485.9	726.7	844.9	1040.9	1176.2	1111.3

Source : Supply-distribution Tables, Bulgaria, Czechoslovakia, Germany-D.R., Hungary, Poland, Rumania and Yugoslavia.

* Figures for these years relate to domestic production only.

ANNEXURE - 2

EAST EUROPE (BULGARIA, POLAND, HUNGARY, RUMANIA
CZECHOSLOVAKIA, YUGOSLAVIA.)

Table - 1 : Cattle and Hogs on Farms, Production of Eggs
and Poultry Meat 1960-66

Particular/ Year	1960	1961	1962	1963	1964	1965	1966
Cattle on Farms (million)	25.0	26.1	26.7	26.3	26.2	26.3	27.2
Hogs on Farms (million)	37.6	39.6	38.5	35.7	38.9	42.2	38.9
Egg Production (million dozens)	1230.0	1288.0	1235.0	1254.0	1365.0	1444.0	1444.0
Poultry meat production (million lbs.)	783.2	816.9	837.5	857.2	923.3	963.1	971.8

Source : See annexure I of (Yugoslavia, Bulgaria, Poland, Hungary,
Rumania, and Czechoslovakia.

ANNEXURE - 2

EAST EUROPE (BULGARIA, POLAND, HUNGARY, RUMANIA,
CZECHOSLOVAKIA, YUGOSLAVIA)

Table - 2 : High Protein Consuming Animal Units, 1960-66

Particular/ Year	1960	1961	1962	1963	1964	1965	1966
Cattle(million)	12.3	13.0	13.2	13.0	12.9	13.1	13.6
Hogs(million)	18.8	19.7	19.2	17.8	19.3	21.0	19.3
Eggs(million)	7.7	9.1	8.8	8.9	9.7	10.2	10.2
Poultry Meat (million)	3.4	3.7	3.6	3.9	4.1	4.3	4.3
Total (million)	42.2	45.5	44.8	43.6	46.0	48.6	47.4

Source : See annexure II of (Yugoslavia, Bulgaria, Poland, Hungary, Rumania and Czechoslovakia.

ANNEXURE - 2

EASTERN EUROPE : (Poland, Hungary, Germany D.R. Yugoslavia
Czechoslovakia.)

Table - 3 : Apparent Consumption of Oilcake Protein per Animal Unit, 1960 - 1966.

Particular	1960	1961	1962	1963	1964	1965	1966
Protein Consumption ('000 tonnes.)	259.8*	303.9*	537.6	633.2	822.7	919.0	853.6
Protein Consumption (million Lbs)	571.6	668.6	1182.7	1393.0	1809.9	2021.8	1877.9
Protein Consuming units (million)	42.2	45.5	44.8	43.6	46.0	48.6	47.4
Consumption per unit (lbs)	14	15	26	32	39	42	40
Oilcake Consumption per Animal unit (Lbs) ^{1/}	32	34	59	73	89	95	91

Source : Annexure Table III of Constituent countries

^{1/} In terms of 44% Protein-content

* Figures relate to domestic production only.

9 POLAND

Apparent consumption of oilcakes (based on net availability) in Poland for the year 1967 is placed at 495,000 tonnes. Of this 279,500 tonnes or 56 per cent is from the domestic crush and the remaining 215,000 tonnes or 44 per cent is imported. Table 1 below shows the trends in domestic production, imports, exports and net availability of oilcakes for Poland for the years 1964 to 1967.

Table 1

Poland: Domestic Production, Imports, Exports and
Net Availability of Oilcakes

(in '000 tonnes)				
Year	Domestic Production (A)	Imports (B)	Exports (C)	Net availability (A+B-C)
1964	220.8	164.7	-	385.5
1965	382.1	157.8	-	539.0
1966	288.8	184.1	-	472.9
1967	279.5	215.5	-	495.0

Source : (A) - Poland Supply - Distribution Tables

(B) & (C) - Polish Trade Year Books.

The domestic crush has been stationary during the two years - 1966 and 1967 at an average level of 284,000 tonnes. The import of oilcakes, on the other hand, has increased from 164,700 tonnes in 1964 to 215,500 tonnes in 1967, indicating increasing dependence on imports.

Data on the imports of oilcakes by type are not available, but it is gathered that groundnut cake contributes nearly 40 percent of the

imports. Soyabean and cottonseed cakes are known to be the major imports.

Examination of the origin-wise imports of oilcakes reveals that India and the U.S.A. are the major suppliers of oilcakes to Poland, their respective shares being 58 and 31 per cent in 1967. Table 2 below gives the trend in imports from different countries since 1964.

Table 2

Poland : Origin-wise Imports of Oilcakes

('000 tonnes)

Origin of Import	1964	1965	1966	1967
Iran	-	11.6	1.1	-
Syria	1.5	-	2.0	2.0
Turkey	2.0	2.8	6.0	4.8
U.A.R.	0.7	0.2	-	-
India	150.4	115.7	112.9	124.5
Denmark	0.5	2.6	-	7.1
France	2.2	0.6	-	-
W.Germany	4.9	2.0	-	2.0
Argentina	1.5	10.9	9.1	3.0
U.S.A.	-	4.8	48.9	66.0
Pakistan	-	-	0.3	4.5
Others	1.0	6.6	3.8	1.6
Total	164.7	157.8	184.1	215.5

Source : Polish Trade Year Books

The imports from U.S.A. which started from 1965 with an initial import of 4,8000 tonnes have increased to 66,700 tonnes in 1967. It may be observed that imports from India have not kept pace with the increased imports of oilcakes by Poland. The main reason was stated to be the high fibre content in groundnut meal supplied by India. Poland is also taking a serious view of the aflatoxin problem.

Imports of fish meal have been increasing in Poland. The import of fish meal was around 10,000 tonnes in 1961 and has grown at a very rapid rate to the level of 82,000 tonnes in 1967. Poland is examining the possibility of importing rice bran from India, especially from the point of view of the quality and suitability of its use in feed manufacture in Poland.

1.4 HUNGARY

Apparent consumption of oilcakes in Hungary, was on an average around 274,000 tonnes per year during the period between 1964 to 1966. As compared to 1962, this reflects an increase of 26 per cent. Imports have grown steadily from 121,900 tonnes in 1962 to 195,600 tonnes in 1966 indicating an average increase of 15 per cent per year. On the other hand the domestic production during the same period has declined from 103,400 tonnes to 86,300 tonnes. Out of the total production of 86,300 tonnes of oilcakes in 1966, sunflowerseed cake accounted for 58,300 tonnes and soyameal 19,000 tonnes. It may be noted that while sunflowerseed is domestically produced soyabean is imported and crushed. Table 1 gives the trend in domestic production, imports, exports and net availability of oilcakes in Hungary for the years 1962 to 1966.

Table 1

Hungary : Production, Imports, Exports & Net Availability of Oilcakes

(in '000 tonnes)

Year	Domestic Production (A)	Imports (B)	Exports (C)	Net Availability (A+B-C)
1962	103.4	121.9	7.7	217.6
1963	98.4	161.7	15.0	245.1
1964	94.6	186.6	-	181.2
1965	75.0	183.7	-	258.7
1966	86.3	195.6	-	281.9

Source : (1) Hungary Supply-Distribution Tables, AGRIMPEX
(2) Hungarian Import agency for animal feed stuffs.

Analysing the trend in the imports of oilcakes by type (Table 2) it is observed that while imports of groundnut cake/meal has been

Table 2

Hungary : Imports of Oilcakes by Type

(in '000 tonnes)

Type of Oilcake	1962	1963	1964	1965	1966*	1967*
Groundnut	94.9	115.4	104.6	99.1	115.4	104.4
Soyabean	12.9	20.7	39.9	40.4	49.0	67.0
Linseed	-	4.8	6.8	5.7	2.4	0.6
Cottonseed	5.4	11.5	28.5	23.6	19.3	21.0
Sunflower	7.1	9.3	5.8	12.4	9.5	10.0
Others	1.6	-	1.0	2.5	-	-
Total	121.9	161.7	186.6	183.7	195.6	203.0

Source : Hungary Supply-Distribution Tables.

* Agrimpex, Hungarian import agency for animal feed stuffs.

fluctuating the imports of Soyameal has increasing steadily. It is also seen that the share of groundnut cake/meal has declined from 75 per cent in 1962 to 50 per cent in 1967. The share of soyabean meal, on the other hand has increased from 10 per cent in 1962 to

33 per cent in 1967. Demand for soyabean meal is increasing because of the increased emphasis placed on the development of poultry and pig feeds for which low-fibre cakes are preferred. In the course of foreign market survey we were informed that Hungary could use groundnut meal for pig feeds in place of soya provided the fibre content was less than 7 per cent. Break-up of import figures according to country of origin is not available, however, it was gathered that in case of groundnut cake/meal, except for a small quantity which comes from Brazil, the entire imports are from India. In case cottonseed cake imports during 1966 and 1967 were mainly from U.S.A., Morocco and Turkey.

11 EAST GERMANY

No published data on the trade in oilcakes is available in the case of East Germany. Hence it is difficult to discuss in any detail the characteristics of this market. However on the basis of the limited data available and on the information gathered during the visit of the study team to this country, the following facts were observed.

East Germany produces a sizeable quantity of rapeseed, the production of which in 1966 was 211,000 tonnes. East Germany also imported nearly 60,000 tonnes of sunflowerseed. Domestic and imported seeds together available for crushing in 1966 was in the region of 280,000 tonnes, giving rise to production of 160,000 tonnes of oilcakes.

From the Indian Foreign Trade Statistics it is gathered that Indian exports to East Germany have steadily increased. The Indian exports reached the maximum of 106,700 tonnes during 1965; but dropped during the subsequent two years, the export during 1967 being 82,400 tonnes. The Indian exports of oilcakes consist mainly

of groundnut meal. The table below gives exports of oilcakes from India to East Germany.

Table 1

Exports of Oilcakes from India to East Germany

(1000 tonnes)

Type of Oilcake	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	18.4	12.5	33.0	60.6	96.1	106.7	66.1	31.3
Copra	0.9	3.8	0.7	-	0.2	-	0.1	0.1
Linseed	8.2	4.9	18.9	8.5	-	-	-	-
Total	27.5	21.2	52.6	69.1	96.3	106.7	66.2	31.4

Imports of fish meal by East Germany have increased from 30,000 tonnes in 1961 to 108,000 tonnes in 1966. East Germany produces about two million of compound feeds per year.

12 CZECHOSLOVAKIA

Czechoslovakia's apparent consumption of oilcakes in 1968 was 284,000 tonnes. Imports of oilcakes accounted for about 57 per cent of this while the rest was met from the domestic production. Consumption of oilcakes has been increasing rapidly from 115,300 tonnes in 1960 to 284,200 tonnes in 1968, the average rate of growth in consumption has been 20 per cent per year. Table 1 gives domestic production, imports, exports and net availability of oilcakes in Czechoslovakia for the years 1960 to 1968.

Table 1

Czechoslovakia : Domestic Production, Imports, Exports and
Net Availability of Oilcakes

(in '000 tonnes)				
Year	Domestic Production (A)	Imports (B)	Exports (C)	Net availability (A+B-C)
1960	115.3	-	-	115.3
1961	135.0	-	-	135.0
1962	93.8	56.0	12.6	137.2
1963	115.1	102.8	39.6	187.9
1964	105.5	176.6	25.6	256.5
1965	149.9	163.4	30.3	282.0
1966	120.4	163.8	-	284.2

Source : Czechoslovakia : Supply-Distribution Tables.

Imported oilseeds contribute on an average 65 per cent to the total domestic production of oilcakes. Thus the dependence of Czechoslovakia on imports, either in cake or seed form, is more than 80 per cent of its total requirements.

The Imports of oilcakes into Czechoslovakia beginning from 1962 has risen almost three times. In 1962, imports of oilcakes had been 56,000 tonnes while in 1966 it stood at 163,800 tonnes. The year 1963 and 1964 saw two rapid increase in imports of oilcakes. In these two years imports registered an increase of 82 and 72 per cent, respectively, over the previous years. Imports have been stabilised, thereafter, at the level of 165,000 tonnes.

Table 2 gives the imports of different type of oilcakes into Czechoslovakia.

Table 2

Czechoslovakia : Imports of Oilcakes by Type

(in '000 tonnes)					
Type of Oilcake	1962	1963	1964	1965	1966
Groundnut	14.1	54.5	98.5	82.1	81.9
Soyabean	0.7	-	14.1	9.0	-
Cottonseed	28.7	39.8	53.2	73.0	81.9
Sunflower seed	9.4	5.2	2.0	2.0	-
Others	3.1	3.3	8.8	2.3	-
Total	56.0	102.8	176.6	168.4	163.8

Source : Czechoslovakia Supply-Distribution Tables.

Czechoslovakia imports of oilcakes consist mainly of groundnut and cottonseed. Almost all of the groundnut meal imports at present come from India. In 1961, imports from India were only 5,000 tonnes but have grown rapidly in the subsequent years to the figures of 82,000 tonnes in 1966.

Imports of cottonseed cake also have shown substantial increase and have moved up from 28,700 tonnes in 1962 to 82,900 tonnes in 1966. It was reported that upto 1966 Czechoslovakia's imports of cottonseed cake have been mostly from the Middle East Countries. However, from the Indian Export Trade Statistics, it is seen that in 1967, almost for the first time, India exported 40,600 tonnes of cottonseed cake to Czechoslovakia.

It is interesting to note that exports of oilcakes from Czechoslovakia consist mainly of cottonseed cake, which it imports in large quantities. The exports of cottonseed cake in 1965 had been as much as 28,300 tonnes. Information on utilisation of oilcakes for various purposes is not exactly known. However it was informed during the visit of the study team that only a small proportion of oilcakes is used directly as feed.

The import of fish meal has increased very considerably. Czechoslovakia imported 8,200 tonnes of fish meal in 1960, by 1967 these had risen to 87,000 tonnes. The use of urea in cattle feed in

Czechoslovakia has not been significant and is not likely to increase in the short run.

The compound feed industry is well developed in Czechoslovakia. There are more than 150 compound feed manufacturing units of various capacities. The production of compound feed has increased from 1.3 million tonnes in 1961 to 3.0 million tonnes in 1967, indicating an average growth of 20 per cent per year. The feed for pigs accounts for a major share of production of mixed feeds. In 1967, production of compound feed for pigs formed 56 per cent of total production on while cattle and poultry feeds formed 24 and 18 per cent respectively. Table 3 gives production of different type of feeds for the years 1961 to 1967.

Table 3

Czechoslovakia : Production of Animal Feeds

	(in '000 tonnes)						
Type of feed	1961	1962	1963	1964	1965	1966	1967
Pigs	856	1004	1055	1249	1495	1600	1693
Laying Hens	80	144	194	230	256	272	299
Other Poultry	72	106	146	133	171	210	260
Cattle	250	252	233	309	360	560	728
Others	44	61	53	26	20	19	22
Total	1302	1567	1681	1947	2302	2661	3002

Source : Agriculture Year Books, Czechoslovakia.

The manufacturers of compound feed have to produce the feeds according to the specifications laid down by the Government. Feeding standards are laid down for different animals at different stages of development. These standards are revised from time to time. Czechoslovakia can be considered as one of the major importers of Indian groundnut meal. The imports of Indian cake/meal have gone up to 82,000 tonnes and indications are that this trade can be increased to more than 100,000 tonnes a year.

The possibilities of increasing trade in cottonseed cake are also high as the total imports of Czechoslovakia are around 80,000 to 85,000 tonnes a year. Already a headway has been made; as stated earlier, in 1967 India has exported a little over 40,000 tonnes of cottonseed cake to Czechoslovakia.

Because of its geographic location, Czechoslovakia prefers to have the materials in bags.

18 YUGOSLAVIA

The apparent consumption of oilcakes in Yugoslavia showed a very rapid growth from 1961 to 1964 (Table 1), consumption rose from 122,200 tonnes in 1961 to 332,000 tonnes in 1964. The overall increase was 170 per cent over these three years. Thereafter there is a slight fall in the consumption, the 1967 level being 238,700 tonnes. Table 1 gives domestic production, imports, exports and net availability of oilcakes for the years 1961 to 1967.

Table 1

Yugoslavia : Production, Imports, Exports and Net
Availability of Oilcakes

('000 M.Tons)				
Year	Domestic Production (A)	Imports (B)	Exports (C)	Net Availability (A)+(B)+(C)
1961	98.4	26.5	2.7	122.2
1962	127.8	50.3	7.0	171.1
1963	179.3	80.5	12.5	247.3
1964	200.0	147.3	15.3	332.0
1965	202.9	137.4	17.0	323.3
1966	211.3	71.9	8.1	275.1
1967	168.2	154.2	33.7	288.7

Source : (A) Yugoslavia Supply - Distribution Tables
(B) & (C) Yugoslavia Trade Year Books.

Domestic production of oilcakes has steadily increased over the years 1961 to 1966. The production has gone up from 98,400 tonnes

in 1961 to 211,300 tonnes in 1966. In 1967 however, there was a fall of 43,000 tonnes in the domestic production as compared to 1966 level. Nearly 90 per cent of the oilcakes produced in Yugoslavia is from domestically produced sunflower seed.

Yugoslavia's dependence on imports, though varying in terms of per cent of consumption, has been growing in absolute terms. The imports of oilcakes increased from 26,500 tonnes in 1961 to 154,000 tonnes in 1967.

Imports of oilcakes in Yugoslavia are mostly from India and U.S.A. Though the break-up of imports by type are not available, it is learnt that imports from India are mainly of groundnut meal and that from U.S.A. are mainly soyabean meal. Table 2 gives the imports into Yugoslavia from U.S.A. and India over the years 1961 to 1967.

Table 2

Imports of Oilcakes from India and the U.S.A.

Year	<u>Quantity ('000 tons) imported from</u>				Percent share of India among total imports
	India	U.S.A.	Other countries	All countries	
1961	7.5	5.0	14.0	26.5	28
1962	24.9	25.4	-	50.3	50
1963	43.6	36.9	-	80.5	54
1964	43.6	103.7	-	147.3	30
1965	57.9	79.0	0.5	137.4	42
1966	5.9	61.3	4.7	71.9	8
1967	11.1	142.6	0.5	154.2	7

Source : Yugoslavia : Trade Year Books-

Imports from U.S.A. were as low as 5,000 tonnes in 1961 but have since grown to reach the level of 142,000 tonnes in 1967. On the other hand imports from India increased from 7,500 tonnes in 1961 to 57,900 tonnes in 1965 but had fallen considerably in 1966 and 1967, the average level for the two years being almost the same as 1961.

Yugoslavia is exporting a small quantity of oilcakes mainly sunflowerseed cakes. The exports were the highest during 1967 - 33,700 tonnes but in the previous years these were less than half this level.

The use of fish meal in Yugoslavia is on the increase. The import of fish meal has gone up from 23,400 tonnes in 1963 to 39,200 tonnes in 1967.

The data on production of cattle feeds in Yugoslavia are available for the years 1964 to 1966 only and are given in Table 3.

Table 3

Yugoslavia : Production of Animal Feeds

(8n '000 tonnes)

Type of feed	1964	1965	1966
Mixed feed	352.0	403.9	594.3
Concentrates	170.3	167.9	184.4
Total	522.3	571.8	778.7

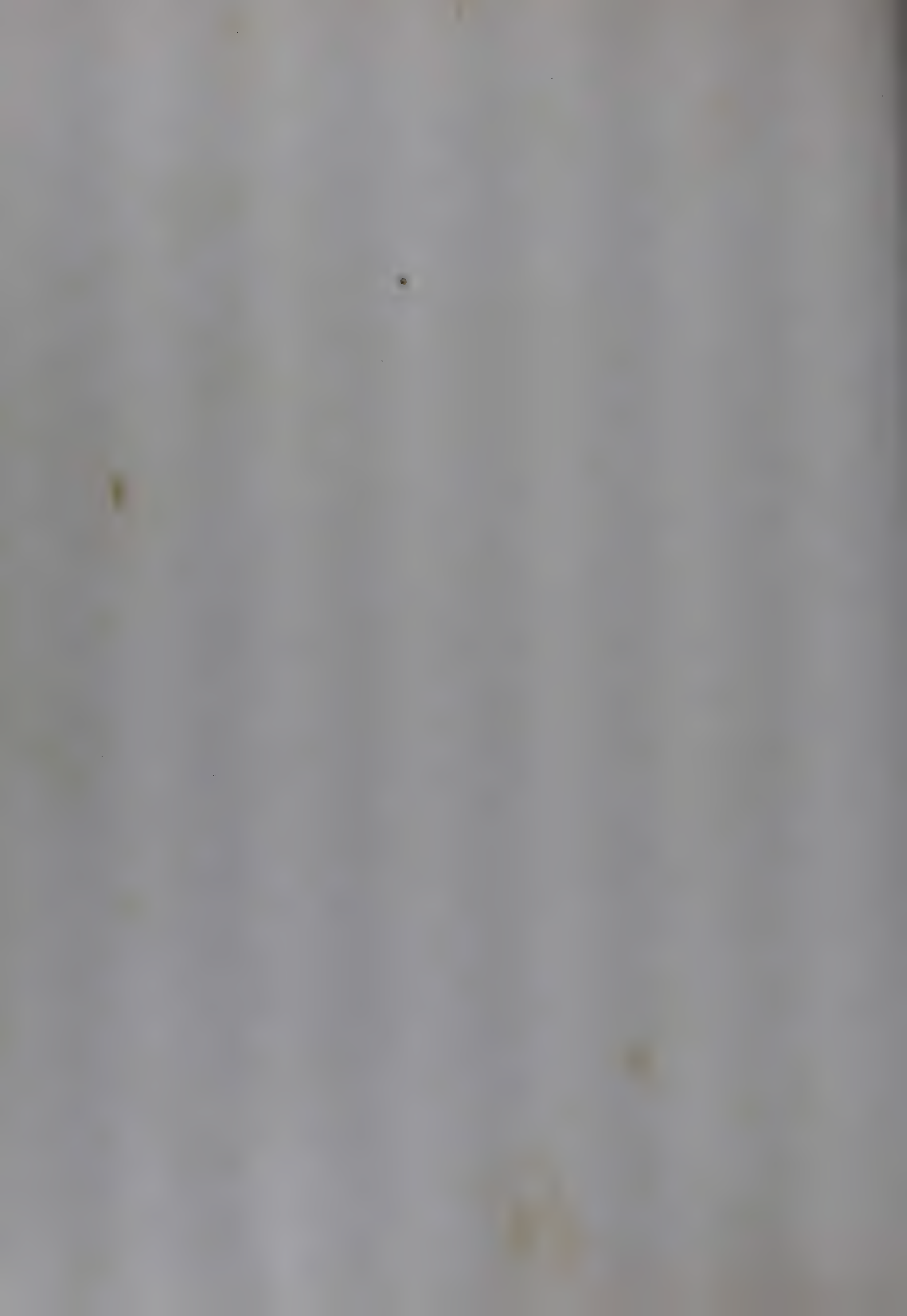
Source : Yugoslavia : Statistical Year Books.

The table shows that the production of mixed feeds has gone by nearly 70 per cent in the two years; the production of concentrates, has however, remained more or less stable.

It has been observed earlier that India has lost considerably her export trade in oilcakes with Yugoslavia during the last two years. Some of the factors affecting Indias exports are given below:

- a) With the development of the compound feed industry in Yugoslavia, demand has tended towards higher quality cakes which Indian exporters are not in a position to supply, the fibre content of groundnut meal being one such. example. Yugoslavian manufacturers want groundnut meal with not more than 3 per cent fibre content.
- (b) It was reported to the study team that Indian exporters often fail to meet the contractual requirements. The crude protein content of Indian extraction has often found to be less than the guaranteed figure. Yugoslavian importers have also reported about the iron impurities found in Indian oilcakes.
- (c) Yugoslavian importers buy oilcakes on f.o.b. basis. The freight charges from India to Yugoslavia works out to be twice that between the U.S.A. and Yugoslavia. This increases the cost of Indian oilcake to the Yugoslav importer.

Unlike in the past when the State directive used to influence the import-export trade, the manufacturers and import-export agencies in Yugoslavia are now functioning more or less like private firms and are responsible for the profitability in their operations. In view of this the Indian exporters will have to offer a better quality product at a competitive price in order to succeed in the Yugoslav market.



14. U.S.S.R.

The domestic production of oilcakes in the U.S.S.R. in 1967 is estimated at 6.7 million tonnes. The major portion of this was consumed within U.S.S.R. itself, exports being relatively small. An examination of the trends in domestic production, imports and exports of oilcakes shows that the net availability has gone up from 4.6 million tonnes in 1961 to 6.4 million tonnes in 1967.

The total imports of oilcakes into U.S.S.R. during 1967 was 57,000 tonnes. A major portion of this was groundnut meal from India. The trend in the imports upto now indicates that the U.S.S.R. does not depend upon imports for its oilcake requirements. The present imports are said to be for experimental purposes.

U.S.S.R. is a net exporter of oilcakes, the present export trade being 376,000 tonnes. From Table - 1, it is seen that the exports during 1967 were more or less of the same level as that of 1961. However, there was a steady fall in exports from 1961 to 1964 when the exports reached the level of only 46,000 tonnes since 1964, exports once again increased to reach the 1961 level. A major portion of exports of U.S.S.R. comprises of sunflower cake/meal.

Table 1

U.S.S.R : Domestic Production, Imports, Exports
and Net Availability of Oilcakes

(in '000 tonnes)

Year	Domestic production (A)	Imports (B)	Exports (C)	Net Availability (A+B-C)
1961	4988	-	386	4602
1962	4973	-	349	4624
1963	4892	-	193	4699
1964	5955	15	46	5924
1965	5836	88	129	5795
1966	6536	64	390	6210
1967	6695	57	376	6376

Source : U.S.S.R. Supply - Distribution Tables.

The trend in destination-wise export of U.S.S.R. is shown in Table - 2 below : The Scandinavian countries are the major importers of U.S.S.R's oilcakes, their imports (during 1966) accounting for a little over one-half of total exports of U.S.S.R. Among scandinavian countries, Denmark imports the maximum quantity.

Table 2

U.S.S.R: Destination-wise Exports of oilcakes from U.S.S.R.

('000 tonnes.)

Destination of Exports	1961	1962	1963	1964	1965	1966
<u>Scandinavian countries</u>						
Denmark	137.3	86.3	45.8	2.6	16.8	111.1
Norway	28.8	18.6	4.7	-	9.0	26.7
Sweden	-	17.1	11.2	0.9	3.7	21.7
Finland	42.6	66.0	61.1	1.7	24.7	43.2
<u>Other Countries</u>						
Belgium	29.1	45.1	13.6	-	11.2	38.3
France	12.8	51.3	17.2	-	9.1	52.0
Holland	51.7	7.7	-	-	-	-
U.K.	36.8	3.6	-	-	-	-
Czechoslovakia	16.6	15.4	15.1	15.0	15.4	-
Hungary	-	10.0	-	-	-	38.0
Others	30.4	27.5	24.5	25.3	39.3	59.5
Total	386.1	348.6	193.2	45.5	129.2	390.5

Source : USSR Trade Year Books.

As in the case of oilcakes the import-export trade in oilseeds also forms a small portion of the total production of oilseeds in the U.S.S.R. In 1967, the total production of oilseeds was 11.5 million tonnes while the imports and exports of oilseeds were only 47,000 tonnes and 225,000 tonnes, respectively.

The production of mixed feeds in USSR was steady at the level of 11 million tonnes per year during 1961 to 1964 and thereafter has increased to reach the level of 17.9 million tonnes in 1967. Table 3 gives the growth in the production of different type of feeds in U.S.S.R. from 1961 to 1967.

Table 3

U.S.S.R. Production of Mixed Feeds

('000 tonnes)

Year	Cattle*	Calves	Pig	Poultry	Others	Total
1961	2104	14	5866	2022	199	10125
1962	1456	15	7681	2633	184	11974
1963	1232	24	7318	2547	101	11022
1964	670	107	7132	2434	181	10524
1965	2480	276	9648	2553	256	15213
1966	2184	250	10084	2984	316	15818
1967	2845	288	10837	3502	446	17918

*excludes calves

Source: Data obtained from the Indian Embassy.

Table - 4 gives the percentage wise content of different raw materials in mixed feed produced in U.S.S.R. over last three years. It can be noticed that the percentage of oilcake used in mixed feeds is around 8.5 per cent. At this rate, total utilisation of oilcakes for the production of mixed feeds works out to be only 23 per cent of the total availability, indicating thereby that the remaining three-fourths of available oilcakes is consumed directly. It may be observed here, as a point of interest, that the percentage of oilcake content in Western countries is of the order of 20 percent. With the further development of mixed feeds, direct feeding of oilcakes will therefore, decline.

Table 4

U.S.S.R. Raw Materials used in Mixed Feeds

Raw Material	Percentage component		
	1965	1966	1967
Grain	51.9	50.8	53.2
Bran	33.3	34.7	32.5
Fodder Yeast	0.5	0.7	0.7
Oilcake	8.4	8.6	8.6
Fish Meal	1.1	1.5	1.4
Meat Meal	0.8	1.0	1.1
Others	4.0	2.7	2.5
Total	100.0	100.0	100.0

Source : Data obtained from the Indian Embassy.

Table 4 shows that the share of fish meal in mixed feed has also remained stationery at 1.5 per cent. This combined with the fact that the production of mixed feeds is going up, has led to an increase in imports of fish meal by U.S.S.R. It is seen that the import of fish meal has gone up from 101,600 tonnes in 1961 to 167,000 tonnes in 1967.

During the course of the foreign markets survey, complaints were heard regarding the non-fulfilment of contractual obligations by some Indian exporters and the undue delay in the settlement of outstanding payments due. In a few cases the quality of the cake shipped was such that it required fumigation at the other end, thereby increasing the cost for the importer. Viewed from the fact that the imports by U.S.S.R. form 5 per cent of the total Indian exports of ground-nut meal, the industry should undertake the necessary corrective measures.

15. U.S.A.

The U.S.A. is by far the world's largest producer and exporter of vegetable oilseed cakes. In 1966, this country alone accounted for 47 percent of world oilcake exports (including the cake equivalent of seed exports). U.S. imports of fishmeal and copra (both copra and copra cake), though they make this country the world's ninth largest cake and meal importer, are small in relation to U.S. consumption. The U.S. exports of soyabeans and soyabean cake and meal have had a profound impact on the world trade of oilseed cake and meals. Moreover, as a potential source of increased supplies in world markets, soyabean meal exports from the U.S.A. will continue to be an important factor in determining price trends in world oilcakes trade. The U.S.A. is here analysed principally as a source of supplies of oilcakes to world markets.

Table 1: PRODUCTION OF OILSEEDS IN THE U.S.A.

(Index: 1960 = 100)

(figures in '000 metric tons)

	1960	% of total	1964	% of total	1967	% of total
Soyabeans	15112	(68.6)	19102	(72.4)	26811	(85.3)
(Index)	100.0		126.5		177.4	
Cottonseed	5539	(24.2)	5647	(21.4)	2973	(9.5)
(Index)	100.0		105.7		55.6	
Linseed	772	(3.5)	620	(2.4)	516	(1.6)
(Index)	100.0		80.0		72.0	
Peanuts	809	(3.7)	1000	(3.8)	1142	(3.6)
(Index)	100.0		123.6		141.4	
Others	4	(Neg.)	4	(Neg.)	4	(Neg.)
(Index)	100.0		100.0		100.0	
Total	22036	(100.0)	26373	(100.0)	31446	(100.0)
(Index)	100.0		119.7		142.7	

Source: See U.S.A.: Supply Distribution

The rapid growth in production of soyabeans in the U.S.A. since the war has resulted from several factors. After the war, domestic demand for vegetable oils and fats and high protein cakes increased rapidly due to rise in income levels and changes in food consumption patterns. With its growth in world trade during the 1950's, export demand for oil cakes has been a major factor determining U.S. soyabean production and prices. Over the six year period 1947-48 to 1953-54 production of soyabeans increased by 43 percent from 5.1 to 7.3 million tons. Over the next six years production doubled to 14.5 million tons. After a relatively lower rate of growth between 1960 and 1964, soyabean production, once again, spurted upward at an annual average rate of 13.5 percent per annum. From an insignificant cash crop at the outset of the second world war, soyabeans are now third largest cash crop - following cotton and corn - produced in the U.S.A. At present 40 cents of each dollar earned by the soyabean producing farmer accrues by way of exports - beans, oil and meal.

The rapid growth in exports of soyabean from the U.S.A. owes both to the growth in demand for soyabean meal in Western Europe and Japan as well as the supply conditions

from the U.S.A. Larger domestic demand for soyabean meal, on the one hand, and adequate availability of other low protein feed grains on the other, has made for stability in prices of this product. Domestic price support policy and relative profitability has ensured a high growth rate in soyabean production. Both these characteristics, price stability and adequate supplies, are highly valued in international trade.

Whilst soyabeans production in the U.S.A. increased rapidly, production of cottonseed has trended sharply downward in the last two years. The reduction in cottonseed output is mainly the result of two factors: (1) the diversion of land away from cotton under the Upland Cotton Programme and (2) heavy abandonment of planted acreage due to adverse prices and damage to crops because of weather, insects and plants disease last year. Diversion of acreage to soyabe from cotton appears to have paid off good dividends. The market for cotton being what it is, it is unlikely that cottonseed production in the U.S.A. will make a marked recovery. However, it may be noted that eventhough the U.S.A. has traditionally been the world's largest producer of cottonseed (its position was slightly superseded by the U.S.S.R. in 1966) - 37 percent of world production - its exports of this product have been relatively small at 7-8 percent of world

exports during the early 1960's. In fact, cut in production in the last two years has resulted in a spurt in cottonseed cake imports in 1967.

In the case of linseed, production fluctuates widely, the price factor is not likely to induce increased production of this oilseed in the U.S.A. Production of peanuts has recorded a steady upward growth. Acreage is limited to 1.6 million acres over the past several years, output expansion is due to the sharp rise in yields per acre. Two-thirds of the peanut production of the U.S.A. is used for direct consumption - fried nuts, peanut butter and the confectionary industry. Exports of U.S. peanuts are also largely for purposes of direct consumption. As such groundnut cakes play a relatively unimportant role as a feedstuff for animals in the U.S.A.

Consumption of
oilseed cake
and meal in
the U.S.A.

U.S. demand for oilcakes recorded a particularly high rate of growth during the post-war years ending in the late 1950's. It must be remembered that unlike in the Continental group of countries and Japan, the U.S.A. has an abundant supply of pasture land. At the same time coarse grains supply an equally important source of

livestock feed. A whole range of feeding stuffs originate at the farm level. Feeding techniques have been developed to optimum levels of high protein feed-conversion ratios.

The table below must be read in the light of the protein value of various animal feedstuffs. The protein feed value varies widely between grain protein feeds on the one hand and fishmeal on the other. The important factor determining the use of different feedstuffs is, of course, price. The abundant availability of different feedstuffs and also substitute products, makes for a high coefficient of the price elasticity of substitution. A steady rise in oilcake prices over the past decade is compared to substitute feedstuffs did not allow for increases in their share of the total animal feed market. In fact, there was slight decline in this share over the 1960-67 period.

Use of oilcakes for feedstuffs increased by 40 percent between 1954 and 1960, but the increase between 1960 and 1967 was, however, a mere 8 percent. The dominating role of soyabean meal is easily observed. Against an overall increase in use of oilcakes of 8 percent during 1960-67, soyabean meal use increased by 24 percent.

Table 2: ESTIMATED USE OF HIGH-PROTEIN FEEDSTUFFS IN THE U.S.A.

('000 metric tons)

	1954	% of total	1960	% of total	1967	% of total
1. Soyabean meal	4939	(22.9)	8042..	(31.5)	10010	(35.1)
2. Cottonseed Meal	2189	(10.3)	2273	(8.9)	1365	(4.8)
3. Linseed Meal	444	(2.0)	344	(1.3)	182	(0.6)
4. Peanut Meal	Neg.	(-)	68	(0.3)	127	(0.4)
5. Copra Meal	165	(Neg.)	147	(0.6)	82	(0.3)
Sub-Total (1-5)	7737	(35.2)	10874	(42.6)	11766	(41.2)
6. Tankage and Meat Meal	1218	(5.7)	1542	(6.1)	1888	(6.6)
7. Fishmeal and solubles	359	(1.6)	496	(1.9)	819	(2.9)
8. Other Animal Protein+	1151	(5.3)	814	(3.2)	637	(2.2)
9. Grain Protein Feeds*	1386	(6.5)	1546	(6.1)	2139	(7.5)
10. Other by-product Feeds@	9641	(44.8)	10237	(40.1)	11216	(39.4)
11. Total (1-10)	21510	(100.0)	25511	(100.0)	28465	(100.0)

Source: Feed Statistics Through 1966, U.S.D.A.;
ERS, Statistical Bulletin No.410, September 1967
Food Situation FDS 224, May 1968, U.S.D.A. ERS.

- + Commercial and non-commercial milk and milk products
- * Gluten feed, Brewers and distillers dried grain
- @ Wheat and rice mill-feeds, molasses, beet pulp, alfalfa meal, fats and oils etc.

Among other high protein feedstuffs, the gains recorded by fishmeal were by far, the most impressive. Considering its high protein value, the increased use of fishmeal in the U.S.A. is particularly important.

Notice that, though the use of other bye-product feeds in the U.S.A. has declined in relative importance, they continue to occupy a significant rôle in the feed requirements of the U.S. livestock and poultry industry.

The overall emerging picture is that oilcakes form an important source of high protein feedstuffs in the U.S.A. The use of these increased rapidly between 1954 and 1960 at the annual average rate of 6.7 but declined to only 1.1 percent per annum over 1960 to 1967.

As against these trends in the use of high protein feedstuffs, let us examine the use of protein feedstuffs like coarse grains and the emerging importance of urea.

Coarse
grains and
Urea

As in most other developed countries, the livestock and poultry industry is a substantial consumer of coarse grains. In the case of the U.S.A., production of such feedstuffs has been growing at very high rate; in terms of price, the U.S.

farmer is far at an advantage compared to his counterpart in Europe, where grain prices are at an artificially high price level and where a substantial part of grain requirements are still imported.

Under a system of Government price support activity, production of feed grains has trended upward over the past several years. The main outlet for feed grains is cattle, followed by use in hog and poultry feeds. In grain surplus areas, the proportion of grain and of home grown concentrates used as feedstuffs is generally higher than in grain deficit areas. An important factor emerging in the U.S.A. has been that more grains and other concentrate type feeds are being fed to cattle. Corn makes up for 37 to 38 percent of the total concentrate ration fed to cattle in recent years. Oats have shown a relative decline, "Feeding of other concentrates (barley, wheat, cottonseed and soyabean meal) was relatively small and changed little as a percent of the dairy cow ration".^{1/}

Trends in the domestic use of feed grains exhibit the same pattern as in the case of high protein feedstuffs.

^{1/} Feed Situation: FDS - 224; op.cit. p. 11

Between 1954 and 1960, it will be observed that domestic utilisation of grain in feeds in the U.S. increased by 34 percent, as against this the rise between 1960 and 1967 was a mere 6.4 percent. Utilisation of grains in other end-uses is limited, and exports have come to play an increasingly important role in grain disposal especially after the Kennedy Round of Tariff Negotiations.

These relative rates of growth in the utilisation of high protein feedstuffs and of grains in the U.S.A. are mainly the result of trends in livestock production. The technique of feeding are highly developed; optimum feed conversion ratios having been established and widely used by the U.S. farmer and the poultry industry. Livestock production is itself determined by livestock and poultry-feed price ratios. Though, there are fluctuations in livestock production due to variable factors, demand for these are already at very high levels and no large increase need, therefore, be visualised in the case of domestic demand for meat and dairy products.

Table 3: FEED GRAINS*: PRODUCTION AND UTILISATION AS
LIVESTOCK - FEED IN THE U.S.A.

(million metric tons)

	Utilisation as feed	Production
1954	81.6	103.8
1960	108.7	141.5
1961	111.0	127.2
1962	108.3	128.9
1963	105.7	140.0
1964	102.8	122.1
1965	114.9	143.2
1966	114.5	143.4
1967	115.6	159.6

Source: Feed Statistics Through 1966; U.S.D.A.,
Statistical Bulletin No.410
Feed Situation, FDS 224, ERS, U.S.D.A.

* Corn, sorghum, oats, and barley

The high per capita consumption level, it must be remembered is influenced by larger consumption in the higher income groups. There is still substantial scope for increased consumption in the lower income groups. Of course change in demand and production pattern of meat and the rate of population growth have to be taken into account.

Table 4: U.S.A.: HIGH PROTEIN CONSUMING ANIMAL UNITS

(Figures in millions)

	1954	1960	1964	1967*
Cattle	-	48.5	52.0	52.6
Hogs	-	24.7	25.4	26.0
Poultry	-	65.0	69.4	77.2
Others	-	2.0	1.5	1.4
Total	135.0	142.9	148.3	157.2

Source: Livestock - Feed Relationships Supplement for 1967,
U.S.D.A. ERS. Statistical Bulletin No.337 (Supp.)

* Preliminary.

The total number of high protein consuming animal units in the U.S.A., it will be observed has increased at a very low rate, 6 percent between 1954 and 1960 and slightly less than 10 percent between 1960 and 1967. Poultry continued to account for the highest growth rate followed by cattle and hogs.

This low growth rate in meat production in the U.S.A. is as explained earlier, mainly the result of sharp increases in earlier years, per capita consumption had reached relatively very high levels by the 1960's. In 1961-63 for example consumption of meat per capita in the U.S.A. was 97.8 kgs. as against 44.6 in Western Europe as a whole and 61.9 kgs. in the Netherlands. The same applies in the case of milk and eggs. These factors must, therefore, be considered as likely to continue operating, domestic production of meat and livestock products can be expected to increase pari-passu with changes in the pattern of income distribution, population and exports. Exports have tended to become restrictive with increased production in importing countries and the policies of self-sufficiency in the ECM group of countries.

Another factor, unlike in most ECM countries, has been the stable levels of high protein feed per animal unit during the 1960's. Between 1954 and 1960, consumption per animal unit increased by 26 percent from 172 lbs. to 217 lbs. During the 1960's, the level has been more or less stable at between 222 to 226 lbs. Taking these two factors into consideration, namely the low rate of growth in livestock numbers and stable per animal unit consumption of high protein feeds, leads us to conclude that an increasing proportion of the production of oilcake meal (including cake equivalent of oilseeds) will be available for exports. The surplus depending, of course, on increased production of oilseeds.

Demand analysis for high protein feeds in the U.S.A. must also take into account fishmeal and urea. The U.S.A., as observed earlier, has rapidly increased the imports of fishmeal and solubles to add to its own production of fish meal - 300-350 thousand tons per annum. The price factor has been an important determinant of the increased use of fishmeal in the U.S.A. The same applies in the case of urea as well.

In the case of urea, it is not possible to make any exact estimates of its use in animal feed due to the paucity of data. Data as are available are, therefore, used only as indicators.

Table 5: UREA PRODUCTION AND SALES IN THE U.S.A.

('000 metric tons)

Year	Production All Urea	<u>Feed Urea</u>		<u>Fertilizer Grade Urea</u>	
		Production	Sales	Production	Sales
1960	668.4	86.5	86.1	499.0	: 498.3
1961	838.9	92.4	97.7	668.4	644.0
1962	919.1	101.4	103.8	735.0	718.3
1963	993.2	115.0	117.9	777.3	739.8
1964	1100.0	108.7	117.4	892.8	857.8
1965	1170.7	137.0	138.9	926.4	110.4

Source: Feed Situation, U.S.D.A. : ERS, FDS-217,
February 9, 1967

The production and sales of feed-grade urea does not reflect accurately the real trend of urea use in the U.S. for feedstuffs. It is widely believed that fertiliser grade urea is diverted for use in animal feeds. Then again, the U.S.A. imports substantial quantities of urea. As an admixture with low protein feed grain, urea is believed to be relatively attractive in terms of price. In 1965-66, even though prices of corn have been rising over the 1960's as a whole, a corn-urea mix had a price advantage of \$ 30 over soyabean meal, as against the average price advantage of \$ 19 over the 1960-64 period. In the Port Worth area, the price of sorghum grain-urea mix averaged \$ 18 per ton less than cottonseed meal in 1965/66. This was against a relatively small price advantage of \$ 5 per ton during earlier years. The shortage of cottonseed cake and its relatively high prices certainly gave a competitive edge to grain-urea mix. This has been a fear which the soyabean crushing industry and the producers have increasingly come to realise. The data below certainly give cause for this fear.

Table 6: U.S.A.: COMPARATIVE COSTS OF GRAIN-UREA MIXTURES AND SOYABEAN AND COTTONSEED MEAL

Year Oct./ Sep.	Corn Urea Mixture \$ per ton*	Soyameal 44% pro- tein \$ per ton	Dif- ference \$ per ton	Sorghum grain Urea Mix. \$ per ton*	Cottonseed meal 41% protein \$ per ton	Difference \$ per ton
1956	57.00	54.35	- 2.65	56.10	57.30	1.20
1960	50.40	64.30	19.90	51.80	60.10	8.30
1961	50.80	67.50	16.70	52.20	65.30	13.10
1962	53.20	75.20	20.00	53.40	72.00	18.60
1963	53.40	75.20	21.80	56.10	68.40	12.30
1964	55.40	74.60	19.20	57.80	63.20	5.40
1965	55.60	85.80	30.20	55.80	73.40	17.60
1966 Oct.	58.80	86.60	27.80	54.90	81.60	26.70
Nov.	56.90	83.40	26.50	57.80	85.20	29.40
Dec.	60.30	89.10	28.80	57.60	89.50	32.30

Source: Feed Situation U.S.D.A. ERS, FDS - 217, February 9, 1967

* Based on a mixture of 1715 lbs of grain and 285 lbs. of urea at 5 cents per lb. Includes a grain grinding allowance of 15 cents per cwt.

It will be easily observed that particularly over the past three years, the price advantage to grain-urea mix has been very attractive. It is believed that this advantage has drawn many farmers to urea - grain mix. It is difficult to say the extent to which substitution can occur in the medium-run time period; there is both tradition and bias which needs to be overcome if the use of urea is to be expanded largely. The present estimates are that urea is used to the extent of $2\frac{1}{2}$ million tons of soyabean meal equivalent. Being a relatively recent phenomenon, i.e. developed over the 1960's, it is difficult to make estimates for the future and the extent to which it could add to the exportable surplus of oilcake from the U.S.A.

The demand for fishmeal increased rapidly mainly on account of the price advantage. Whilst prices of fishmeal trended downward that of soyabean meal has been ruling firm. The compound feed manufacturers and feed-users in the U.S.A. being highly price conscious, this led to the spurt in demand for fishmeal.

The
Exportable
Surplus

The relative movements in production and domestic utilisation of oilcakes and meal in the U.S. partly explain the constantly large and growing supply available for exports. As we will show below both the production of beans and meal has been

increasingly geared to the requirements of the international market. One important factor that needs to be kept in mind is the large domestic base for the industry, the market characteristics of which make it abundantly suitable for international marketing as well.

The U.S.A. exports mainly soyabean meal, exports of cottonseed meal fluctuate widely and are presently of little significance. Linseed cakes, the second most important oilcakes exported from the U.S.A. just account for 2.3 percent of soyameal. Exports of peanuts, being mainly for direct consumption are not considered for the present analysis.

Table 7 shows the trends in exports of major oilcakes and meals from the U.S.A. Exports of oilcake and meal from the U.S.A. increased by slightly less than 113 percent over the seven year period 1960 to 1967. Almost the entire increase was on account of soyabean - both beans and cakes.

Table 7: U.S.A.: EXPORTS OF OILSEED MEAL AND CAKE

('000 metric tons)

	1960	1964	1965	1966	1967
1. a) Soyabean	4031	5702	6197	6689	7114
b) Meal equivalent of 1(a)*	3184	4505	4896	5284	5620
2. a) Linseed	106	177	100	170	153
b) Meal equivalent of 2(a)+	68	113	64	109	98
3. a) Soyabean Meal	527	1574	1969	2271	2465
b) 1(b) + 3	2211	6079	6865	7555	8085
4. a) Linseed Meal	37	53	87	116	88
b) 2(b) + 4	105	166	151	225	186
5. Cottonseed Meal	71	82	128	38	3
Total meal	3887	6327	7144	7818	8274

* Cake conversion ratio 79 percent

+ Cake conversion ratio 64 percent

Source: U.S.A. Supply-Distribution Tables

Again, it will be observed that the major part of this growth in exports of both beans and cake has occurred over the 1960 to 1964 period, exports failed to keep their earlier pace, thereafter. Exports of soyabeans from the U.S.A. increased by 24 percent as against 56 percent in the case of soyabean meal over 1964 to 1967.

Increased production of soya, a moderate increase domestic demand and a slowing down in the export growth rate is easily reflected in stock positions for the past two years. As will be observed stocks of both beans and meal are at relatively very high levels. Meals stocks in 1967 are below the peak in 1963, but bean stocks in that year were down substantially. In the course of our discussions with the industry and trade, the level of stocks for 1968 was expected to be even higher (175 million bushels) than official estimates. The industry has been caught between low oil prices on the one hand and relatively high bean prices on the other and the result is that meal prices have to be maintained at levels which allow them to break even. As Prof. Hieronymus points out, "with the price of soyabeans in the grip of

Table 8: U.S.A. STOCKS OF SOYABEAN AND MEAL

	<u>Soyabeans</u> ^{1/} (million bushels)	<u>Soyabean meal</u> ^{2/} (['] 000 tons)*
1960	51.2	76
1961	27.1	71
1962	78.3	86
1963	46.0	145
1964	67.3	111
1965	29.7	96
1966	35.6	120
1967	90.1	126
1968	160.0	-

Source: Fats and Oils Situation, U.S.A.I.D., June 1968 op.cit

^{1/} September 1st

^{2/} October 1st

* Metric Tons

the loan, the values of the products must be high enough to pay for soyabeans and to provide a modest processing margin. Whenever product supplies are too great to permit such prices, the crush will be reduced and product prices will be forced up. This in turn, will curtail use."

"In this circumstances of a fixed price for soyabeans, products tend to pivot. As the demand for one increases so that greater production is called forth, the price of the other is forced down by oversupply. Thus, the relative demands for oil and meal are of interest". In a telling sentence the author concludes "The failure to price soyabeans competitively has hurt the industry during the past three years. I cannot be optimistic about solving the problem during the next 18 months".

(Prof. T.A. Hieronymus : Address to the Tri-State Soyabean Forum, Greenville, January 26, 1968). It is this factor also which has damped domestic demand when prices for soyabean meal have recorded a sharp rise.

Supply
Prospects

This impasse has been recognised by all the interests in soyabean, the impact on long-term prospects would indeed be adverse. The increased use of urea and

fishmeal in the U.S., the efforts being made to develop synthetic amino acids for large scale use in feed and high-lysine corn on the horizon owe their progress mainly to relatively high priced oilcake protein. This position of soya has now reconciled the producer to a lower support price level. In our discussions with the industry, growers interests and the government in the U.S.A., we found that a minimum cut in soyabean support price would be of the order of 25 cents per bushel, a larger price cut of 35 cents cannot be ruled out. This would come into effect after the Presidential elections for the next crop. This cut down in price would ensure for a lowering of bean and meal prices by a minimum of 10 percent.

Thus cut down in price would ensure better capacity utilisation of plants in the U.S.A. It is believed that this move would particularly stimulate domestic demand in two ways: (1) it would enable oilseed cakes to cut into the inroads made by urea and fishmeal and (2) it is likely to stimulate the use of oilcake protein per animal unit because the U.S. livestock and poultry industry is particularly sensitive to the livestock poultry-feed price ratios.

The impact of this price cut on soyabean production is not expected to be adverse. The shifts from barley, oats and

hay to soya, so widespread over 1960-66, are likely to continue. What is more important from the increased supplies angle, is the scope for bringing in idle land under soyabean. Both the Delta area (Arkansas, Mississippi and Louisiana) and the South East (North and South Carolina, Georgia, Alabama, Kentucky and Tennessee) where a high proportion of the land is not under cultivation, is suitable for soya. At present about 40 million acres are under the Government's acreage restriction programme. (the Land Bank as it is sometimes called). Of these 10 million acres cannot be used for cultivation. Further inroads into corn acreage by soya are unlikely, the movement from soya back to corn is also not likely to be particularly large. The scope for increased cultivation of soya is evident from the large corporate activity in the southern woodlands where land acquisition and clearing costs are recovered in only three years of operation. This area is being developed for soya because of transport facilities from Gulf ports to the Continent. In fact, this production is entirely export oriented.

Yields of soyabean have not been able to record any significant break-through over the past several years; the product does not respond to fertilizer use. We were, however, informed in the course of our foreign markets survey, that intensive efforts are being made to increase the yields. Some pay-off in these efforts may be expected.

There is no way of estimating to an accurate extent the increased production likely; the past trends - say 1960-67 - cannot be extrapolated because of the limitations for further shifts, say, from cotton and corn to soyabeans. What is likely, however, is that part of the idle land in the areas mentioned could be brought under soya. One could, on the basis of discussions with experts in the industry and trade, expect that production will continue to grow at the rate of 5 percent per annum. This would result in increased availability of 10 - 11 million tons of soyabeans, or 8 - 9 million tons of meal. This expansion could at most serve as a rough guide. Supply projections in a country where several substitutes can be produced and where each increase is likely to have effects on prices, domestic and export demand and where past relationships between variables are distorted by governmental policy, can

only be in the nature of an informed guess. It may be emphasised that the above estimate is in line with expectations amongst industry and trade in this product. Domestic utilisation of high protein oilseed cake in the U.S.A. increased by a mere 8 percent over the 1960-67 period. In the case of soyabean meal domestic demand increased by 24 percent i.e. 3.4 percent per annum - over the same period. Trade and industry circles in the U.S.A. visualised an expansion of 4 to $4\frac{1}{2}$ percent in domestic demand for soyabean meal over the next few years. On the basis of this estimate domestic demand for soyabean meal would be around 13.2-13.6 million tons. This would leave an exportable surplus of 16.1 to 16.5 million tons of soyabean meal, as opposed to actual exports of 8.3 million tons in 1967. One inevitable conclusion is that increased supplies from the U.S.A. are bound to exert a downward pressure on international oilcake and meal prices in the period 1968-75. Soyabean meals versatility, combined with this increased export availability is therefore, bound to exert a competitive pressure on the use of other oilcake and meal prices. This downward pressure on prices would of course depend on the U.S. Government's acreage restriction policy. Thus far

there has been no such control on soyabean because of its firm price trends. There is no enthusiasm for such a policy in future, the reasons are well known. The above only indicates the difficulties in forecasting prices, particularly of agricultural products.

Salient Features
of the U.S.
Export Trade
Organisation

The U.S. Soyabean export trade is highly concentrated. At present only about eight firms account for almost 90 percent of the business. The more important ones are internationally operating business organisations - Burge, Central Soya, Continental Grain, Pillsbury Co., Louis Dreyfus, Carnac Grain etc. The export business is highly specialised and one finds very few crushers do export business on their own. The only crusher doing large export business is Central Soya (accounts for 25 percent of total U.S. Soyabean crush).

Each function in the export business e.g. export warehousing and handling, export elevators, has been further allocated among specialist firms. For example, only six firms do the entire handling of cake from mills to ports. The result is that marketing costs decline very sharply.

The futures markets for beans, meal and oil are used fully in the export business. The most important market is the Chicago Board of Trade.

All export business is done on c.i.f. basis. Except to a very limited number of countries like Cyprus, Lebanon and Isreal, the export business is done in bulk. Whilst, we were given conflicting freight rates, varying by \$ 2-3 in some cases, the standard rate is 11-12 from Chicago to Europe. (This compares very favourably with freight rates from India to the continental ports). In addition two costs have to be borne in transport of soyabean and soyabean meal in bulk. One is the internal cost of transport from mill or bin-site to port. The transport cost by barge, which is how most of the beans are transported, is 6 cents per bushel from Memphis to Gulf. (Notice that rail costs are 13 cents, but this mode of transport is used very rarely). Elevation and other handling charges are another $2\frac{1}{4}$ cents a bushel. These add up to \$ 3.10 per metric ton. The c.i.f. price is also inclusive of the unloading cost at Rotterdam for transshipment by barges to destination ports all over Europe, these vary between \$ 1 - 1.50 per ton. These are standard rates for

conference lines. However, chartering of vessels is very common, in the case of tramps freight rates are down by as much as 40-50 percent of the rate given above. Leasing of vessels for varying periods of time by some export houses is becoming increasingly common. On this count it must be observed that the freight advantage to the U.S. exporter over his Indian counterpart is very high indeed. As against these freight rates, the rates for bagged shipment are exorbitant - we were given a figure of \$55 ton Cyprus. Moreover, the ample shipping facilities allow the exporter to even speculate on freight rate fluctuations in addition to speculation in meal export business. The freight rate given above is the average inclusive of insurance. Almost all shipments are such that a ship-full cargo is destined for a single port.

An important feature of the U.S. soyabean and soyabean meal export business is the close liaison an exporter maintains with his market. Almost all firms have their branch offices or representatives in the consuming areas, and are thus in a position to feel constantly and consistently the pulse of the market. In order to develop a market, the American firms supply technicians to set up feed manufacturing units. They were also

mainly responsible for developing the broiler industry in these countries. Some of the soyabean crushing units have even set up feed-manufacturing units in Europe. Several new plants of huge processing capacity for soyabean crushing are being opened up in Europe in order to take advantage of the market situation which at the same time promotes their bean sales.

The turnover of the business being very high, technical and managerial expertise are widely diffused in the importing markets. Communications are the second largest expenditure item in the export business budget. Being a quick turnover business communication facilities are very essential.

Exports of soyabeans and meal are subsidised in an indirect way in the U.S.A. Exports of soyabean oil on PL 480 basis helps the export business; it must be emphasised that this indirect subsidy is small and uncertain, (for example exports under PL 480 dropped very significantly last year). Exports of soyabean is neither regulated by the government nor are exports taxed. The minimum price

guarantee on cottonseed and the assurance of crushing margins in this product is not important, in view of the very limited exports of cottonseed cake from the U.S.A.

The American Soyabean Association is the principal export promotion body for soyabean and soyabean products. It has several affiliates e.g. the various state Soyabean Associations, the American Soyabean Association Research Foundation, The Japanese American Soyabean Institute, National Soyabean Processors Association and the Soyabean Council of America, Inc. The Soyabean Council has offices at important centres all over Europe and some developing countries - India, Pakistan, Iran etc. The council has an annual budget of \$ 200,000 which is jointly financed by the processors and the United States Department of Agriculture. Each year, the council formulates a marketing plan which is scrutinised by the Government. Among the several functions performed by the council are: (1) the council, through its representatives, keeps the processors informed of various developments in importing countries. (2) Participates in and organises seminars and meetings (e.g. seminar on swine-feeding techniques in Austria), (3) Organises and participates in trade fairs and feeding techniques' demonstrations. (4) Makes studies of individual markets for soyabean, soyabean meal and oil. The Council publishes

regularly information on the market structures of importing countries. Booklets on the uses of soyabean meal and feed-formulas suited to particular countries are published and distributed. (5) The council keeps a close liaison with the producers and processors and helps individual firms to carry out extensive marketing activities. (6) The Council has been known to carry out vigorous enquiries on any complaints pertaining to the product which are then transmitted to the industry. (7) The council assists visits of importing organisations to the U.S.A., helps to bring them into a contact with processors and similarly facilitates the visits of U.S. businessmen to Europe and Japan and other countries. (8) The council finances research in the botany of soyabeans and is making efforts to increase yields per acre. The American Soyabean Association's research on end uses of meal for human consumption has been intensive. Lastly, emphasis needs to be paid on the Council's extensive contact with consumers, traders and the governments in the interests of this commodity.

The Soyabean Digest - Blue Book Issue - published by the American Soyabean Association provides a wealth of

information to the international trade interests of high protein animal feeds.

The contracts traded in are mainly the London Cattle Food Trade Association contracts. The U.S. exporters have had no problems of arbitration and contracts settlement in recent years when specifications are for 49% protein. In earlier years, when the specification was higher at 50 percent, there were several complaints, due to deterioration in transit, hence the switch over to 49 percent specification, though in actual practice the American exporter sells 50 percent meal. The U.S. exporter has been very quality conscious and has adapted the product to the requirements of the importer. The American exporters and processors gave us to understand that the quality of meal produced in European countries is below standard, and that there are no standard quality specifications as such in their (i.e. European's) own produce. It is emphasised that U.S. exporters' experience has been that European buyers have shifted to lower quality products whenever prices move up. This confirms our view that price is a more important consideration in Europe than quality as such.

The American
Industry's
Outlook on
Export
Markets

In the course of our discussions with processors, traders, the U.S. Department of Agriculture and the Soyabean Council (also with U.S. exporters' representatives in Europe) we found that there generally was a favourable outlook on export prospects both for beans and meal. The crushing margin problem which has by no means been favourable in the U.S., it is expected, would be remedied by the lowering of the soyabean support price. The prospects for increased output of soyabeans to a level of 1.5 billion bushels by 1975 would ensure the industry with adequate bean supplies. A substantial increase in capacity utilisation is possible, the industry is operating only 80 percent of the rated capacity at present. The expansion in capacity from 525 million bushels in 1960 to 750 million bushels in 1967 has been accompanied with an increase in the number of mills from 126 to 135; the average per mill capacity rose from 4.3 million bushels to 5.5. The modernisation programmes mainly directed at increased mill capacity and re-organisation of location so as to cater either for domestic or export markets, has largely been completed. The expansion of processing capacity will continue essentially to cater for the export market. The scope for increased meal exports is based on the

difficulty of the European industry in the disposal of soyabean oil.

The main markets towards which the exporter will continue to concentrate in the short run are Western Europe and Japan. In both these areas, the trade visualises rapid growth in demand for high protein oilseed cake and meal due to improved livestock and poultry feeding. These countries, however, are not in a position to absorb substantial increases in vegetable oils and again the taste for soyabean oil as such ~~has~~ yet to be cultivated. They are optimistic of opening a larger market for soyabean in some countries.

Many firms in the U.S. are now turning to the East European countries, where they consider the market potential is just being tapped. Exports to these countries have yet been very limited; exports of soyabean meal to these countries increased from 23,200 tons in 1961 to 259,600 tons in 1966. Preliminary figures for 1967 suggest a sharp increase in soyabean meal exports to Yugoslavia, Poland, Hungary, Bulgaria and Czechoslovakia. The relatively low meat and dairy per capita consumption in these countries indicates the possibility for increased production of meat and dairy products. Under the East-West detente trade with

these countries has received a boost; moreover the U.S. administration does not discourage this growth in trade any longer. It is not possible to make any quantitative estimate of the export possibilities to this area.

Summing-up

The U.S. supply-distribution of high protein oilcake and meal, as well as feed grains indicates that this country would be able to double her oilcake exports by 1975. This would be mainly the result of an increase in production of soyabeans against a limited growth in domestic demand. This increase in supplies would be bound to exert a pressure on world price trends for high protein animal feedstuffs in general. The U.S. soyabean producer and the processing industry are increasingly adjusting to the requirements of a rapidly growing world import market.

ANNEXURE TABLE F

U.S.A.

CATTLE AND HOGS ON FARMS, PRODUCTION OF EGGS AND POULTRY MEAT, 1960-67

	1960	1961	1962	1963	1964	1965	1966	1967
Cattle on Farms (million)	96.2	97.5	100.0	103.7	106.7	109.0	108.0	109.0
Hogs on Farms (million)	59.0	55.5	57.0	58.9	58.1	53.1	57.2	50.7
Egg Production (million doz.)	5342.0	5328.0	5367.0	5318.0	5308.0	5474.0	5537.0	5814.0
Poultry Meat (Million lbs.)	6341.0	7183.0	7127.0	7403.0	7678.0	8170.0	8981.0	9418.0

Source: Official Statistics, U.S. Department of Agriculture.

ANNEXURE TABLE II

U. S. A.

HIGH PROTEIN CONSUMING ANIMAL UNITS, 1960-67

Particular	1960	1961	1962	1963	1964	1965	1966	1967 ^{1/}
Cattle (million)	43.5	49.6	52.1	52.2	52.0	52.3	53.0	52.6
Hogs (million)	27.4	27.9	28.6	27.8	25.4	24.6	26.3	26.0
Poultry (million)	65.0	64.7	65.1	66.8	69.4	73.0	77.7	77.2
Other (million)	2.0	1.9	1.8	1.7	1.5	1.5	1.4	1.4
Total (million)	142.9	144.1	147.6	148.3	148.5	151.4	158.4	157.2

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Source: Official Statistics, U.S. Department of Agriculture.

^{1/} : Preliminary

(see note on methodology for projections in Chapter I, Volume II.)

ANNEXURE TABLE III

U. S. A.

CONSUMPTION OF OILCAKE PROTEIN PER ANIMAL UNIT, 1960-67

Particulars	1960	1961	1962	1963	1964	1965	1966	1967
Protein consumption ('000 tonnes)	6188.0	6467.0	6627.0	6587.0	6587.0	6946.0	6986.0	6986.0
Protein consumption (million lbs.)	13642.1	14257.1	14609.9	14521.7	14521.7	15313.1	15401.3	15577.7
Protein consuming unit (million)	142.9	144.1	147.6	148.5	148.3	151.4	158.4	157.2
Consumption per unit (lbs.)	96	99	99	98	98	101	97	99
Oilcake consumption per Unit (lbs.)	218	225	225	222	222	230	221	225

Source: Annexure Table 2, Official Statistics, U.S. Department of Agriculture.

✓ In terms of 44% protein content.



16. LATIN AMERICA

Latin America forms an important source of oilcake supply to Western Europe. The region as a whole increased its exports of oilcake and meal (including cake equivalent of oilseeds) from 1.1 million tonnes in 1960 to 1.8 million tonnes in 1966. This increase was more or less in line with the growth in world exports of this commodity and Latin America retained its share of 10-11 percent of world exports. (These data do not take account of the fishmeal export trade of Peru. Growth in world exports of fishmeal, mainly from Peru, increased very rapidly).

The export trade in oilseeds and oilcakes of this region originates mainly from Argentina, Brazil and, to a much lesser extent from Mexico. These three countries together accounted for 95 percent of the Latin American export trade in oilcakes in 1960; their share continued to remain very high, being 91 percent in 1966. The levels and growth in exports of oilcakes from other Latin American countries are given in the world trade tables. Annexure Tables A to I below, give the data for the aggregate supply-distribution of oilseeds and oilcakes for Argentina, Brazil and Mexico

None of the three countries mentioned above undertake any significant imports of oilseeds; oilseed exports are relatively small and show a wide degree of fluctuation (see Annexure Table B). Exports of

linseed which averaged 83,000 tonnes in 1960-61, have dropped off to insignificant levels. On the other hand, soyabean exports have emerged as the single most important oilseed export from this region, but these again fluctuate very widely. Past trends of Latin American exports indicate that Latin America is unlikely to emerge as a substantial exporter of oilseeds.

Oilseeds production in the three countries has increased very rapidly from 4.6 million tonnes in 1960 to 6.4 million tonnes in 1966. Preliminary figures for Argentina and Brazil indicate that production increased substantially in 1967 as well. Production of oilseeds has been encouraged by a system of guaranteed prices, more or less on the same system as support price levels for agricultural products, followed even in advanced countries.

A wide range of oilseeds are produced in this region. Of these, production of soyabeans increased most rapidly on account of the sharp expansion in the acreage under this oilseed in Brazil. In fact, soyabeans alone accounted for slightly over 40 percent of the increase in total oilseeds production of the region. The production of sunflowerseed also made a headway, production having doubled over the period 1960-66. This oilseed - sunflowerseed - is concentrated

mainly in Argentina, from which country exports showed no increase. Production of groundnut showed a modest growth of 30 percent over the six-year period, the growth was evenly spread over both Argentina and Brazil. Production of cottonseed in this region, is concentrated mainly in Mexico; output of this oilseed trended slightly upward.

These countries have large livestock population. Brazil had the world's second largest cattle population, 90.6 million head of cattle as against 108.9 million in the U.S.A. in 1966. Argentina has the third largest cattle population. Again, Brazil has the world's largest hog population, 62.5 million. Very little is known about poultry in this region. However, the large livestock population is maintained mainly on the extensive pasture lands and other farm products. Techniques of feeding are more or less similar to those prevailing in other developing countries, that is, none of these countries have evolved any sophisticated techniques of animal feeding. Oilcake consumed in the domestic economy is mainly used as a direct feed. There is no information on the extent to which oilcakes are used as fertilizer. Given the demand for vegetable oils in their own countries and the need for foreign exchange (most of these countries have serious balance of payments problems), oilcake is, to a large extent, exported. Thus, of the increase of total oilcake production (estimated) between 1960 and

and 1966 of 1.1 million tonnes, exports accounted for 453,000 tonnes for about 42 percent of the increase. The result was that the apparent domestic consumption of oilcake which accounted for 61 percent of total output declined to less than 58 percent over the 1960-66 period.

Examining the structure of the oilcake export trade of this region, it will be seen that increased production of soyabean meal, though they increased very sharply in 1965 and 1966, accounted only for 26 percent of total meal production in the region. However, the future prospects seem to be particularly bright considering that soyabean production expanded rapidly due to increased acreage in the last two years. Given the favourable demand situation in importing countries on the one hand and the high meal content of this oilseed, exports could increase rapidly. However, as in most other developing countries, diversion from foodgrains acreage to oilseed is necessarily limited. In the case of sunflowerseed cake, exports tended to increase at a relatively faster rate than that of the production of sunflowerseed cake. A substantial part of this growth came from Argentina, but at the cost of other oilseed cake exports. Argentina has been making attempts to grow the high proportion oil content sunflowerseed - the Russian variety. This variety has an oil content of 45 percent. This shows, on the one hand, the increasing demand for vegetable oils in this country, the prospects for meal exports are

therefore less bright. In the case of groundnut cake as well, exports from this region tended to grow at a faster rate than that of the output of groundnut cake. Exports of cottonseed cake, originate almost entirely from Mexico. Cottonseed cake exports from this country form a small and fluctuating proportion of total cottonseed cake output. This is largely explained by Mexico's own feed requirements. Mexico has a relatively limited grassland and pasture resource as compared to the other Latin American countries like Brazil and Argentina. Moreover, the Mexican Government is interested in developing the livestock industry and provides no incentives for exports of cottonseed cake per se. Demand for meat is increasing at a rapid rate because of the high rate of growth in Gross Domestic Product.

The overall production of oilseeds in the region expanded by 6.5 percent per annum over the period 1960 to 1966. However, sunflower seed and soyabeans alone accounted for over 70 percent of the total increase in oilseeds production of the region. Both these oilseeds increased their production through increased acreage rather than increased yields as such. The limitation of making inroads in area devoted to foodgrains is obvious. Technical breakthrough in high yielding varieties in both these oilseeds has not yet occurred, as is evident from the experience in the U.S.A. As the situation now

prevails, one cannot but be pessimistic of any large-scale expansion in the output of oilseeds over the next few years. At the same time, the need to increase foreign exchange earnings will induce governments to maintain a system of incentives for growth in oilseeds production and exports of oilseed products. Given these considerations, it is unlikely that production and exports will increase at a rate faster than they did over the past six years. An informed guess on the growth rate in exports of oilcakes from this region would be about 5 percent per annum.

Of the three countries mentioned, the survey team visited Argentina and Mexico. A detailed review of oilcake economy of these countries is given, in what follows.

LATIN AMERICA (MEDICO, ARGENTINA & BRAZIL)

TABLE A: PRODUCTION OF OILSEEDS

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut <u>u/</u>	939.8	1174.5	1005.8	880.7	1205.0	1288.8	1210.6	-
Soyabean	277.3	376.9	364.8	382.0	548.7	633.0	1019.2	-
Cottonseed	1821.5	1996.5	2017.7	2022.9	2100.9	2267.3	2003.7	-
Sunflowerseed	585.2	859.5	462.3	460.2	756.9	782.3	1119.6	-
Rape/Mustard	8.1	7.1	8.1	11.2	9.1	7.1	7.1	-
Linseed	607.5	860.5	897.1	807.7	873.8	633.6	627.8	-
Sesamum	129.0	146.3	155.4	169.7	160.5	180.1	155.0	-
Palm Kernel	22.4	22.4	22.4	24.4	25.4	25.0	26.0	-
Copra	179.8	199.1	204.2	205.2	207.3	169.7	188.5	-
Total	4570.6	5642.8	5137.8	4964.0	5887.6	5986.9	6357.5	-

LATIN AMERICA (MEXICO, ARGENTINA & BRAZIL)

TABLE B: IMPORTS OF OILSEEDS

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut s/	-	-	-	-	-	-	-	-
Soyabean	-	-	2.0	1.0	2.0	2.0	2.0	-
Cottonseed	3.1	1.0	2.0	1.0	1.0	1.0	0.7	-
Total	3.1	1.0	4.0	2.0	3.0	3.0	2.7	-

LATIN AMERICA (MEXICO, ARGENTINA & BRAZIL)

TABLE C: EXPORTS OF OILSEEDS

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut s/	6.1	8.2	29.5	19.3	3.1	25.1	21.9	-
Soyabean	-	73.2	101.6	35.5	2.0	77.3	123.2	-
Cottonseed	-	-	-	-	-	-	-	-
Sunflowerseed	-	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-	-
Linseed	63.0	102.7	7.1	44.7	-	6.1	0.9	-
Sesamum	-	1.0	5.0	23.4	2.0	0.4	2.5	-
Palm Kernel	-	-	-	-	-	-	-	-
Copra	-	-	-	22.4	7.1	-	-	-
Others	-	-	-	-	-	-	-	-
Total	69.1	185.1	143.2	145.3	14.2	108.9	148.5	-

LATIN AMERICA (MEXICO, ARGENTINA, BRAZIL)

TABLE D: OILSEEDS AVAILABLE FOR CRUSHING

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966
Groundnut s/	651.7	813.9	674.5	597.1	840.4	877.0	825.5
Soyabean	277.3	303.7	265.2	347.5	548.7	557.7	898.8
Cottonseed	1824.6	1997.5	2019.7	2023.9	2101.9	2268.3	2004.4
Sunflowerseed	585.2	859.5	462.3	460.2	756.9	782.3	1119.6
Rape/Mustard	8.1	7.1	8.1	11.2	9.1	7.1	7.1
Linseed	544.5	757.8	890.0	763.0	873.8	627.5	626.9
Sesamum	129.0	145.3	150.4	146.3	158.5	169.7	152.5
Palm Kernel	22.4	22.4	22.4	24.4	25.4	25.0	26.0
Copra	179.8	199.1	204.2	182.8	200.2	179.7	188.5
Total	4222.6	5106.3	4696.8	4556.6	5514.9	5494.3	5848.5

LATIN AMERICA (MEXICO, ARGENTINA, BRAZIL)

TABLE E: OILCAKE EQUIVALENT OF OILSEED CRUSHED

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	364.9	455.7	377.7	334.5	470.6	491.1	462.2
Soyabean	219.1	239.9	209.5	274.5	433.4	440.5	709.4
Cottonseed	766.3	838.9	848.3	850.0	882.7	952.6	841.8
Sunflowerseed	392.1	575.8	309.7	308.3	507.1	524.1	750.1
Rape/Mustard	4.4	3.9	4.4	6.1	5.0	3.9	3.9
Linseed	348.5	484.9	559.6	488.3	559.2	401.6	401.2
Sesamumseed	67.1	75.5	78.2	76.6	82.4	93.4	79.3
Palm Kernel	11.6	11.6	11.6	12.7	13.2	13.0	13.5
Copra	62.6	69.6	71.4	63.9	70.0	59.3	65.9
Total	2236.6	2755.8	2480.3	2414.0	3023.6	2979.5	3327.3

LATIN AMERICA (MEXICO, ARGENTINA, BRAZIL)

TABLE F: IMPORTS OF OILCAKES & MEAL

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut								
Soyabean								
				N I L				
Cottonseed								
Total								

LATIN AMERICA (MEXICO, ARGENTINA, BRAZIL)

TABLE G: EXPORTS OF OILCAKES & MEAL

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Groundnut	149.1	220.4	243.2	222.6	149.7	253.5	335.2	-
Soyabean	-	35.0	49.1	62.0	43.8	105.1	183.0	-
Cottonseed	154.4	200.9	188.9	168.0	199.3	173.7	156.8	-
Sunflowerseed	217.9	248.6	255.4	217.3	181.3	275.8	371.6	-
Rape/Mustard	2.7	3.3	1.8	2.9	3.7	3.2	1.2	-
Linseed	395.2	387.0	514.2	501.7	486.3	562.2	326.1	-
Sesamum	-	-	-	-	-	-	-	-
Palm Kernel	-	-	20.0	16.3	33.3	35.2	45.0	-
Copra	-	-	-	-	-	-	-	-
Others	57.7	25.7	4.6	8.4	11.9	10.2	16.1	-
Total	977.0	1120.9	1277.2	1199.2	1109.3	1418.9	1435.0	-

LATIN AMERICA (MEXICO, ARGENTINA, BRAZIL)

TABLE H: NET AVAILABILITY OF OILCAKES AND MEAL AND
NET AVAILABILITY OF FISHMEAL

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	215.8	235.3	134.5	111.7	320.9	237.6	127.0
Soyabean	219.0	204.9	160.4	212.5	389.6	335.4	526.4
Cottonseed	611.9	638.0	659.3	682.0	683.4	778.9	685.0
Sunflowerseed	174.1	327.2	54.3	91.0	325.8	248.3	378.5
Rape/Mustard	1.7	0.6	2.6	3.2	1.3	0.7	2.7
Linseed	-46.8	97.9	55.4	-13.4	72.9	-160.6	75.1
Sesamum	67.0	75.5	78.2	76.0	82.4	93.4	79.3
Palm Kernel	11.6	11.6	-8.4	-3.7	-20.1	-22.2	-31.5
Copra	62.9	69.6	71.4	63.9	70.0	59.3	65.9
Others	-57.7	-25.7	-4.6	-8.4	-11.9	-10.2	-16.1
Total	1259.5	1634.9	1203.1	1214.8	1914.3	1560.6	1892.3
Fishmeal	16.2	12.4	20.0	27.9	34.7	32.0	49.4

LATIN AMERICA (MEXICO, ARGENTINA, BRAZIL)

TABLE I - RAW PROTEIN EQUIVALENT OF OILCAKE & MEAL
(INCLUDING FISHMEAL)

(in '000 metric tons)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	112.2	122.3	69.9	58.0	166.8	123.5	66.0
Soyabean	100.7	94.2	73.7	97.7	179.2	154.2	242.1
Cottonseed	250.8	261.5	270.3	279.6	280.1	319.3	280.8
Sunflowerseed	54.4	121.0	20.0	33.6	120.5	91.8	140.0
Rape/Mustard	0.6	0.2	0.9	1.1	0.4	0.2	0.9
Linseed	-16.8	35.2	19.9	-4.8	26.2	-57.8	27.0
Sesamum	26.8	30.2	31.2	30.4	32.9	37.3	31.7
Palm Kernel	2.0	2.0	-1.5	-0.6	-3.6	-3.9	-5.6
Copra	13.8	15.3	15.7	14.0	15.4	13.0	14.4
Others	-21.3	-9.5	-1.7	-3.1	-4.4	-3.7	-5.9
Fishmeal	10.5	8.1	13.0	18.1	22.6	20.8	32.1
Total	543.7	680.5	511.4	524.0	836.1	694.7	823.5

Source: SS-DD Tables Mexico, Argentina & Brazil

17 ARGENTINA

Argentina has been traditionally an important supplier of oilseeds and oilcakes to Western Europe. The total production of the oilseeds has, however, been fluctuating widely even though the acreage under cultivation was about the same. Application of modern methods of cultivation and usage of fertilisers are not followed. In the case of sunflowerseed, an attempt is being made to grow the improved variety (Russian black) which has about 50 percent oil content as against 35 percent oil content in the Argentine seeds. Institute National De Technologic Agro Pecuraia (INTA) has been conducting a series of experiments in finding out improved strains of seeds which are pest resistant but have yet to find strains which respond to fertilisers. The average yields of the oilseeds in the country are as follows:

Linseed:	600 kgs/hectare
Sunflowerseed:	750 kgs/hectare
Cotton:	260 kgs/hectare (as kilos of fibre/hectare)
Groundnut (in pods):	1160 kgs/hectare

Sunflower

More than 80 percent of the sunflowerseed crop is raised as a single crop while 20 percent of production is obtained as a second crop in wheat fields. The Government controlled National Grain Board

fixes up, at the beginning of the sowing season, a guaranteed minimum price for the crop. However, the Board does not have the exclusive right of purchase. Only when the farmers are unable to sell the produce in the open market to crushers, is the seed sold to the Board.

The guaranteed minimum price for the past few years has been as follows:

Crop year	Minimum price pisos/100 kilos	Approx. exchange rate during this period. Pisos/US \$
1963-64	1100	120
1964-65	1400	150-170
1965-66	1400	170-190
1966-67	1700	250
1967-68	1800	350

Sunflowerseed is usually expelled and extracted and the extracted meal is made into pellets and shipped. The percentage of expeller cake exported is very negligible. There are no restrictions on the export of expeller cakes. However, the sunflowerseed expeller cake develops a higher free fatty

acid on storage leading to rancidity and there have also been instances of auto-combustion of expeller cakes whereby shippers prefer extractions.

On a visit to one of the leading sunflowerseed expeller-cum-extraction unit (SAFRA) in Argentina, the following points were noted:

This big unit with a capacity of about 450 tonnes of seeds per day, has a storage capacity of about one month's raw material requirements. The seeds are cleaned, decorticated, flaked and then sent to the cookers from where they are sent to the screw-type expellers. Most of the equipment is indigenously fabricated and are not as sophisticated as in Nigeria or Senegal. While not much care is taken about cooking, the pressing is done only upto a stage when the cake retains 15 to 16 percent oil. This lessens the load on the expeller and the cake is at a fairly low temperature (about 80-90°C). The foots (residues) obtained from the presses (these are more in these screw expellers, because of their age) and oil filters are re-expelled.

The expelled cake is sent to the Bolman type solvent extractor and the extracted cake desolventised, and sent to pelletising machine. The foots from the refining plants are not added to the pelletising machine, since they find difficulties in operation. An average analysis at the different stages of operation are:

Analysis of seed

1. a) Moisture: 9.5 percent
b) External substance: 1.8 percent
c) Kernels: 68.4 percent
d) Shell: 29.8 percent
2. Average percentage kernel in husk: 0.70 percent
3. Average percentage husk in kernel: 11 to 12 percent
4. Percentage oil in expeller cake: 16 to 19 percent
5. Percentage oil in extracted cake 1 to 2 percent
6. Oil from expeller press:
 acidity 0.78 percent
 sediment 4.0 percent
 colour Y.35 + R.3.5 + B.0 *
7. Oil from extractor
 acidity 0.90 percent
 sediment 1.6 percent
 colour Y.35+ R.4.5+B.0 *

* Y = Yellow; R = Red; B = Blue

8. Analysis of pellets:

Oil:	2 to 3 percent
Protein:	33 to 36 percent
Moisture:	9 percent
Fibre:	19 to 20 percent

In Argentina, sunflowerseed cake is mainly extracted since the price of oil is about 4.5 times the price of the cake and the manufacturer would like to extract as much oil as possible. There is no system of extracting units purchasing expeller cakes for extraction.

Almost all the export of extraction cake is in the form of pellets. The pelletising machines (3 units) have a total capacity of about 10,000 tonnes per month. Even though pelletising may involve some additional cost, it is more than offset by the saving in handling charges at ports. The saving is upto \$ 1.5 per tonne of cake. The average cost of production including direct and indirect (depreciation etc.) charges works out to about \$ 15 per tonne. An indication about the cost of pelletising unit with capacity of 10,000 tonnes per month along with concrete storage of 4000 tonnes was given to be about \$ 150,000 (about 11.5 lakhs rupees).

Most of the units switch over to other types of seeds e.g. linseed and groundnut depending on the availability and price structure.

There are totally 104 units in Argentina engaged in oil milling, 11 with capacity of 200 tonnes and above per day, 17 with capacity between 100 and 200 tonnes per day and the rest with capacity below 100 tonnes per day. The total crushing capacity in the country is about 11,250 tonnes per day (or about 3.75 million tonnes per year). However, only about 50 percent of the installed capacity is utilised. Most of the smaller units find it difficult to survive due to the heavy competition and narrow margins. Some of them have even been closed. It is estimated that during the period August-September 1968, only about 40 units will be running.

Linseed

The second most important oilseed in Argentina is linseed. The guaranteed minimum price for the past few years is given below:

Year	Price - Pisos per 100 kg.
1963-64	1200
1964-65	1200
1965-66	1300
1966-67	1650
1967-68	2200

There are no special equipment for the processing of linseed. However, most of the smaller units having only expellers operate solely on linseed in the provinces of Santa Fe & Entre Rose. Linseed is mainly exported as expeller cake. One reason for this is that the price of the expeller cake is almost half the price of the oil unlike sunflowerseed where the ratio is 1:4:5. An average analysis of linseedcake pellets is as follows:

Moisture	:	10 percent
Oil	:	2 to 6 percent
Protein	:	33 to 34 percent
Fibre	:	9 percent.

Most of the linseed export goes to the Continent. There has been no complaint in so far as toxicity (possible linase or linarin effect) of linseed cake is concerned.

Groundnut:

Groundnut is grown only in the province of Cordoba and is processed in the same province. The export of cake is done through the port at Buenos Aires. There are two big units having extraction facilities while about

a dozen have only expelling facilities. A major part of the cake is exported as expellers only.

The guaranteed minimum price for groundnut producers were as follows:

Year	Price - Pisos per 100 kgs.
1963-64	1350
1964-65	1700
1965-66	1900
1966-67	2400
1967-68	2850

The processing of groundnuts is very similar to that of the other oilseeds. Normally, the oil content left after first processing is about 15 to 17 percent, and after second pressing, it comes down to 6 to 8 percent. Since there the weather is quite dry during harvesting of groundnut and since the seeds are quite dry, there has been no aflatoxin problem regarding Argentine cake so far.

There is no practice of adding shells to the kernels during crushing and hence the fibre content of the cake is invariably very low - 6 to 7 percent only. This is in line with the practice in other groundnut processing countries like Nigeria and Senegal.

Cottonseed

Cotton is grown only in the province of Chaco in Northern Argentina. There are two big solvent extracting units and about 6 expeller units. All the cottonseed is usually delinted, decorticated and processed.

There are no guaranteed minimum prices for cottonseed since the prices are much higher than international prices. Fluctuating prices have led to a decrease in acreage in 1966-67. The farmers have resorted to the production of cereals and other food crops. However, in 1967-68 the average price shot up again and it is expected that production will increase by about 20 percent.

The average price of cotton (full) with fibre for the past three years was as follows:

1965-66	30,000	pisos per tonne
1966-67	30,000	"
1967-68	50,000	"
		(partly an impact of devaluation)

However, the future prospects are not so bright since the prices are still above international prices and to process the seed and sell at world market prices would result in a loss to the processors. The exports of cottonseed cake and meal are as follows:

Exports of cottonseed cake and meals by type

Year	Expeller		Pellets		Cake (meal)	
	Tonnes	\$	Tonnes	\$	Tonnes	\$
1964	27,943	2,066,925	37,362	2,464,428	8,107	516,744
1965	29,355	2,135,856	47,001	3,118,692	6,602	412,805
1966	32,165	2,261,578	26,095	1,703,304	11,229	604,534
1967	34,750	-	28,055	-	6,905	-

Export
Procedures

The export trade is usually done through brokers or agents at the buying end. Most of the export is in the form of pellets and in bulk. The normal shipping³⁾ cost (freight) is about \$8.50 per tonne of cake and it takes about 21 days to reach the U.K. or the Continental ports.

Because of devaluation, the Government often changes its export policy. However, during the last one year there has been no devaluation. The Government fixes a retention price and levies export duty on this price for the commodities exported. They were as follows on 1-12-1967.

	Retention Price <u>\$/Tonne</u>	% export duty <u> </u>
<u>Extraction, meals of</u>		
a) Linseed	80	25
b) Sunflowerseed	62	"
c) Groundnut	81	"
d) Cottonseed	62	"
<u>Pellets (meals of)</u>		
a) Linseed	81	25
b) Sunflowerseed	62	"
c) Groundnut	82	"
d) Cottonseed	63	"

	Retention Price \$ / Tonne	% export duty
<u>Expeller, cakes of</u>		
a) Linseed	86	25
b) Sunflowerseed	64	"
c) Groundnut	86	"
d) Cottonseed	75	"
<u>Oil:</u>		
a) Linseed	165	25
b) Sunflowerseed	187	8
c) Groundnut	242	20
d) Cottonseed	-	20

Prospects

Even though the oil milling industry has been fighting for its existence, the big size units hope to compete with the soyabean and sunflowerseed (from the U.S.A. and U.S.S.R. respectively) by increasing the capacities of the processing units, by having the seeds at a lower price arising from higher yields per acre etc.

There is not much use for the cake in the country in the form of compound feeds for cattles used for beef. Natural pasture and weather conditions being favourable, cattles need no compound feeds. The compound feed industry is basically only for poultry and this too has been started

only recently. It is estimated that not even 10 percent of the country's production of oilcakes will be consumed internally for such compound feed.

18 MEXICO

The most important oilseed grown in Mexico is cottonseed, though, of late the production of soyabean has been given more importance. Statistics on production, area and yield of the two seeds are as follows:

Year	Cottonseed		Soyabean	
	Area	Prodn.	Area	Prodn.
	'000	'000	'000	'000
	Hectares	Tonnes	Hectares	Tonnes
1962-63	832	767	35	47
1963-64	784	836	15	20
1964-65	760	928	24	32
1965-66	869	934	51	62
1966-67	759	815	75	101
1967-68	650	699	90	121

Most of the cottonseed cake production is consumed within the country and only a small percentage of the cake is exported. The production and export figures are given below.

The production of cottonseed cake has not gone up in the recent years. On the other hand, exports have gone down due to increased demand arising from ~~animal feed industry~~ within the country.

Production of all oilcakes and cottonseed cake

('000 tonnes)

	1963-64	1964-65	1965-66	1966-67	1967-68
Total production of all oilcakes	458.3	514.8	614.0	695.9	642.2
Production of cottonseed cake	316.2	359.0	391.9	336.0	304.1
Export of cottonseed cake/meal	73.7	95.1	84.8	64.6	46.8

Mexico has about 74 expeller units and 16 solvent extraction units. Most of the solvent extraction units process either soyabean or cottonseed. The capacities are as follows:

Installed capacity of Expeller units = 1346 tonnes/day

Installed capacity of solvent extraction units = 1168 tonnes/day

Actual production in 1966 was only 60 percent of the installed capacity. There are quite a number of small units which generally close down for six months in a year due to non-availability of raw material as well as economic reasons. The Government has fixed a minimum guaranteed price for all the oilseeds excepting cottonseed grown in the country. The domestic prices are invariably higher than the international prices by about 16 to 24 US \$ per tonne. This has been done intentionally to give an incentive to the farmers to grow more soyabean. In the case of cotton (since there is no minimum guaranteed price), the farmers are reluctant to increase the acreage and hence the decrease has been witnessed in production.

The export of cottonseed cake is mostly in an extracted powder (meal). All cottonseed cakes are of the decorticated variety. Pelletising is not usually carried out.

Mexico is not very interested on export of cottonseed cakes but is keen on growing more soyabean and utilising most of the cake/meal for its own domestic consumption as an animal feed.

19. Japan

Japan, though the world's second largest importer of oilseed cake and meal, is at present, not an important market for oilcakes as such. Except for imports of about 100,000 tons, almost all these are in the form of oilseeds. As a potential market over the next 5-8 years, however, several factors appear to make increased imports of cake and meal inevitable. These are: (1) the low rate of growth in demand for vegetable oils, (2) the high rate of growth in demand for oilcakes and meal and (3) the consistently adverse crushing margins in the oilseeds processing industry. From India's trade point of view the market certainly has a potential. India has from time to time been able to participate in this limited oilcakes market; fluctuations from year to year do not allow for any trend observations in Japanese imports of oilcakes over 1960 to 1967.

The table below gives an idea of Japan's overall dependence on imports for her high protein cake and meal requirements for selected years.

Table 1: JAPAN: IMPORT DEPENDENCE: OILSEEDS AND OILSEEDS CAKE
AND MEAL

('000 metric tons)

	1960	1964	1967
A. Domestic seed production	817	512	421
B. Imports of oilseeds	1492	2157	3151
C. Domestic Production of Oilseed cake and meal	1589	1837	2466
D. Imports of Oilseed cake and meal	1	102	79
E. Imports of Fishmeal	13	96	71
E. <u>Apparent consumption of</u> <u>Oilcakes</u>	1599	2011	2588

Source: Supply-Distribution Tables - Japan.

Domestic production of oilseeds in Japan has consistently declined and in 1967 accounted for less than 12 percent of the total oilseeds available for crushing. Imports of oilseeds have consistently increased at the rate of 16 percent per annum. Imports of oilcakes and fishmeal, it will be observed, fluctuate from year to year.

There has been no tendency for oilcake imports to increase more rapidly than oilseeds over the last seven years.

Production of
Oilcakes in
Japan.

Detailed data on the trends in oilcake production are given in the Supply Distribution Tables for Japan. Table 2 below, shows the composition of oilcakes produced in Japan in selected years.

Table 2: JAPAN: PRODUCTION OF OILCAKES* BY TYPE

('000 metric tons)

	1960	% of total	1964	% of total	1967	% of total
Peanuts	-	(-)	3	(0.1)	5	(0.2)
Soyabean	701	(65.0)	964	(66.0)	1214	(67.7)
Cottonseed	43	(4.0)	96	(6.6)	123	(6.9)
Copra	25	(2.3)	31	(2.1)	40	(2.2)
Linseed	52	(4.8)	59	(4.0)	65	(3.6)
Rapeseed/Mustard	125	(11.6)	102	(7.0)	170	(9.5)
Sunflowerseed	14	(1.2)	1	(Neg.)	37	(2.1)
Others	120	(11.1)	204	(14.2)	140	(7.9)
Total	1080	(100.0)	1460	(100.0)	1794	(100.0)

Source: The Japan Oil & Fat Importers and Exporters Association, Tokyo

Note: Data are for crushing mills in the organised sector only. Those excluded are mainly the small units using domestically produced rapeseed. No data are available for this sector.

Table 2 above, gives production of oilcakes in the organised sector of the oilseeds processing industry in Japan. These figures differ widely from those derived on the basis of production and imports of oilseeds given in the supply-distribution tables. This difference is the result of (1) the large direct consumption of soyabean in the form of traditional food items in Japan, (2) peanuts are almost entirely used for direct human consumption and (3) the exclusion of cake produced in the unorganised sector of the Japanese oilseed processing industry. There are no year to year data on the quantity of oilseeds thus consumed in Japan. A comparison of the estimated oilcake produced on the basis of production of oilcakes can at best give a rough approximation of oilseeds diverted to the above mentioned usages.

The most important features of Table 2 are (1) the consistently high share of soyabeans in the Japanese crush and (2) the dispersion among various other oilseeds accounting for 30 to 32 percent of the total Japanese production of oilcakes.

Since World War II, Japan has rebuilt her oilseed processing industry on a modernised large scale basis. Most of the organised mills have capacity of over 100 tons

per day; all are equipped for bulk handling and are located on ports (or deep water mills as they are called). Almost all the mills use the continuous solvent extraction process. Though, in 1965, there were 935 "oil factories", only 32 had capacities of 100 tons and over per day. The high degree of concentration, is evident from the fact that only 8 firms accounted for slightly over 80 percent of the total Japanese crush in the organised sector. The organised units are members of the Japan Oilseed Processors' Association which is said to have strong influence on Japanese trade policy. (It may be mentioned that manufacturers' and traders' organisations in Japan influence policy to a high degree).

The growth of the oilseed processing industry in Japan on modern large scale basis is a feature of the post-war period. Increased demand for vegetable oils and fats could not be met from domestic supplies of oilseeds. Exchange shortage made imports difficult under free exchange from traditional oilseed suppliers. This impasse was overcome through the imports of soyabean from the U.S.A. under the Government Aid for Rehabilitation in Occupied Areas. This form of imports continued till June 1950 when the scheme was abolished. Since then upto 1953, imports of soyabean were allowed under the automatic approval system, whereby soyabean

processors were allowed to import soyabeans from any source; the U.S.A., however, continued to be the main supplier. With the emergence of exchange difficulties once again in 1952-53, the Japanese Government adopted a quota system (the Fund Allocation System) whereby dollar allocations were made to individual processors and general trading firms for imports of soyabeans. Notice that over the entire post-war period till the late 1950's, import policy was such that it influenced the industry to increasingly gear itself to the processing of soyabeans.

The growth in demand for vegetable oils and fats in the immediate post-war years due to rising income levels had at the same time been accompanied by a change in food consumption habits in Japan (This change can also be partly attributed to the influence of Western Culture). Meat and dairy products' consumption in Japan has increased very rapidly over the past decade. The encouragement given by the Japanese Government to the livestock and poultry industry has vastly stimulated the production of these products. The adaptability of the Japanese farmer to modern feeding techniques in turn stimulated demand for mixed feeds and high protein oilcakes and meals.

The growth of the oilseed processing industry over the past several years cannot be explained by the profitability during this period. As keen observers of the Japanese industry point out, future prospects seem to be the main basis for continued expansion in capacity. At present only 65-70 percent of the rated capacity is being utilised. Crushing margins have been poor right since 1961 (during the course of the foreign markets survey we were given to understand that these had turned to be particularly adverse during the past several months). Inter-firm competition has been severe right from 1961, when soyabean imports were liberalised. Under the Kennedy Round of Tariff Negotiations, Japan has scaled down the import duty on soyabeans to 960 yen per ton from July 1st 1968 (prior to this date, the duty was 4800 yen per ton). The duty is to be further reduced in stages to reach 50 percent of the 1968 level by 1st January 1972. This lowering of the import duty is likely to further increase competition.

The survival and growth of the soyabean processing industry is also partly explained by the many-products nature of this enterprise. Most of the processors undertake refining and retail sales of their products. In these circumstances it is difficult

to allocate costs of processing for soyabean meal or other oilcakes per se. An authoritative source (Mr Nakamura) placed the processing costs at an average of \$ 15 per ton in bulk. (Notice that costs in India compare very favourably with those in Japan).

The general experience in Japan has been that even short-lived improvements in crushing margins bring about an immediate response to increased imports of beans; consequently increased supply pulls down the crushing margin.

Consumption
of oilcakes
in Japan

Japan consumes a substantial part of soyabeans as a direct traditional food item, - Miso or soya sauce, tofu or bean curd and natto or fermented soyabeans. In pre-war years consumption of soyabeans in such forms accounted for as much as one million metric tons. At present almost 50 percent of soyabean available for crushing (see Supply-Distribution Tables - Japan) is utilised for food items. The demand for these types of food products has levelled off in the last few years. Increased demand for soyabean will, therefore, depend on the growth of livestock and poultry feedstuffs industry.

Nearly all the rapeseed cake produced in the unorganised sector and as much as 50,000 tons of soyabean meal is used as fertiliser.*

These various end uses of the principal oilseeds import clearly ruled out the use of the supply-distribution Tables for evaluating demand for oilcakes as a high protein feeding-stuff in Japan. What we, therefore, did was, to take the official figures of oilcakes produced in the organised sector and deducted from these a constant sum of 300,000 tons as being used for miso, shoyu, other food and fertilisers^{1/} during 1960 to 1967. This gives us oilseed cake and meal available for animal feedstuffs.

Since Japan does not undertake any large exports of oilcakes, the pattern of oilcakes and meals consumption is more or less identical with that of production. One may mention three outstanding features of oilcake used as feedstuffs in Japan (1) Consumption of oilcake and meal, including fishmeal

* Japanese Import Requirements: Projections of Agricultural Supply Demand for 1965, 1970 and 1975, Tokyo, 1964 Table 95, p. 183.

^{1/} Japanese Import requirements, op. cit, p. 183, Table 95.

increased on an average at the rate of 15 percent per annum, over the 1960-67 period. This rate of growth has been consistent. (2) Soyabean meal consistently accounts for over 50 percent of the total oilcake and meal consumed in Japan, (3) Japanese consumption of fishmeal after rising very sharply between 1960 and 1965 has, thereafter, tended to stabilise.

Demand for concentrates as feedingstuffs in Japan is to a great deal influenced by the availability of other feedstuffs, both domestically produced as well as imported. The change in Japanese food consumption habits - namely the consumption of less starchy food has made available several of these for animal feedstuffs - viz. potatoes and other tubers; bran and coarse grains are used extensively. Apart from these, Japan is known to use by-products and waste products for animal feeding.

However, the Japanese farmer has tended to increasingly rely on marketed feedstuffs, the production of which is increasing on an average by 22 percent per annum. Direct feeding of oilcake to livestock is limited, it has been estimated at around 120,000 tons per annum. Japan does not use urea as a feed mix.

The Japanese
Mixed-Feed
Industry

Table 3: JAPAN: PRODUCTION OF MIXED FEEDS

(in '000 metric tons)

Type of Mixed Feeds	1957	% of total	1961	% of total	1967	% of total
Poultry	996	(80.7)	3127	(76.3)	5885	(62.5)
Cattle	173	(14.2)	403	(9.8)	1133	(12.0)
Pigs	51	(4.1)	465	(11.3)	2237	(23.8)
Others	14	(1.0)	101	(2.6)	162	(1.7)
Total	1234	(100.0)	4096	(100.0)	9417	(100.0)

Source: Ministry of Agriculture and Forestry, Japan.

Table 4: JAPAN: INGREDIENTS USED BY COMPOUND FEED MANUFACTURERS

('000 metric tons)

Ingredients	1960	% of total	1964	% of total	1967	% of total
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Cereals	1512	(52.4)	4275	(58.2)	5657	(63.3)
Fishmeal	171	(5.9)	371	(3.1)	337	(3.8)
Oilcakes	333	(11.5)	917	(12.5)	1241	(13.9)
Others	869	(30.2)	1780	(24.2)	1696	(19.0)

Total	2884	(100.0)	7343	(100.0)	8931	(100.0)
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Source: Ministry of Agriculture and Forestry, Japan

Among the different types, production of pigs' mixed-feed was able to show the highest rate of growth followed by that of cattle and poultry in respective order. Sharp increases in poultry production during earlier years has resulted in a relatively low profitability ratio reflecting on the demand for poultry mixed feeds.

Production of mixed feed in Japan is spread over nearly 619 mills (figure for March 31, 1967). However, just about 8 firms account for 40 percent of the total output. A further 35 percent of this output is accounted for by the ZENKOREN co-operative. Only two oilseed processors have their own feed manufacturing units. The compound feed manufacturers depend mainly on domestic oilseed processors for their oilcake requirements. Most of the large feed manufacturers enter into long term contracts with processors in order to ensure stability of supply and price. The ZENKOREN, however, undertakes to buy oilcake through open bids for its members from time to time. As regards imports of oilcakes, compound feed manufacturers deal only through established shippers of international repute - viz. Mitsubishi, Mitsui, etc.; ZENKOREN, however, undertakes imports of oilcakes directly.

As in the case of the oilseed processing industry in Japan, the compound feedstuffs industry is also highly competitive. The raw material costs account for as much as 87-88% of the final selling price. The result is that the industry is extremely cost conscious; the use of the computer in order to determine the most economic feed-mix is widely prevalent.

The important feed manufacturers of Japan are all members of the Japan Feed Manufacturers Association, Tokyo. The Zenkoren; and the Dairy Feed Manufacturers' Association function separately.

Examining the ingredients used in compound feed manufacture, the low proportion of oilcake and meal used is rather unusual, as is also the high proportion of cereals used. Japanese feed manufacturers have to depend on imports for their grain requirements to the extent of 80-85 percent. In the category, 'others', bran is the most important; however, this product is obtained mainly from domestic sources and imported wheat bran from the U.S.A. and Canada.

Comparing the proportion of high protein oilcakes and fishmeal used in compound feeds in Japan to those, say,

in the U.K., which may be considered optimum, it is obvious that this proportion will increase very little, over the next few years. As observed in Table 4, this proportion has been gradually increasing. It is not possible to say that the U.K. represents the optimum oilcake intake per animal unit because there are geographical considerations which may make it necessary and economic for other countries to use less or more oilcakes viz. availability of domestically grown cereals, pasture land etc.

Livestock
and
Poultry

The rise in income levels has greatly influenced the food consumption pattern of the Japanese. Consumption of meat and dairy products, though it has been increasing very rapidly over the past decade is still less than 1/8th that of the E.E.C. The Japanese Government has undertaken several measures to promote the growth of livestock, dairy products and poultry production. The domestic prices of these have been maintained at high levels through the imposition of both, import quotas as well as high import duties. The import duty on beef is 25 percent ad valorem, in the case of pork and poultry the rates are 10 and 20 percent respectively. The impact of these measures on the number of livestock and

and poultry produced in Japan may be observed from Annexure Tables II and III.

In a relatively short period of five years the total number of high protein consuming animal units increased by 62 percent; the highest rate achieved by any country over the same period. This rate is expected to continue with increased emphasis on beef cattle and poultry. However, given the basic land resource limitation, the scope for expanding production of beef cattle appears limited.

Turning to the question of oilcake consumption per animal unit, there has been a marked step up since 1963. These levels now compare favourably with those in the U.K. and may, therefore, be expected to continue more or less unchanged.

Projections made on the basis of meat and eggs production (the projections for meat and eggs are as taken from the FAO study), show that Japan would need 2.2 to 2.4 million tons of oilcakes and meal for her livestock industry alone (see Annexure Table IV). This would mean an increase of 57 to 71 percent in oilcake requirements for the livestock and poultry industry in Japan.

It is difficult to gauge the extent to which this increased demand for high protein oilcake feed would come by way of cake imports or by way of oilseeds i.e. mainly soyabean, as such. A study prepared by Institute of Agricultural Economic Research^{2/} projects a small exportable surplus of oilcakes from Japan. This conclusion is arrived on the basis of an assumed rate of growth of 16 percent per annum in vegetable oil requirements. We, however, found that for the past several years, per capita consumption of vegetable oils has been more or less stable. There is undoubtedly scope for expansion in vegetable oil and fats consumption, considering the per capita levels in other industrially advanced countries. However, an expansion at the rate of 16 percent per annum seems most unlikely. Again, the stiff competition between processors of vegetable oilseeds in Japan has made for low oil prices. Added to this has been the sudden spurt of imports of high oil contents - sunflower seed from the U.S.S.R. These imports, it is rumoured, are likely to be stabilised under long term agreements. These factors suggest that Japan would have to increase imports of oilcakes and meal as such, more rather than oilseeds imports.

^{2/} Japanese Import Requirement Projections of Agricultural Supply and Demand for 1965, 1970 and 1975, Institute of Agricultural Economic Research, Tokyo, Japan 1964.

Japanese
Oilcake
Imports of
Direct
Interest
to India

Indian exports of groundnut meal and cottonseed cake to Japan show a wide degree of year to year fluctuation. In the case of the former - groundnut meal - India has been a major supplier to Japan over several years. In the case of cottonseed cake, the experience of exports to West European countries has been repeated. The beginning made of such oilcake exports to Japan was halted because of inadequate supplies with the sharp increase in exports to East European countries.

Table 5: JAPAN: ORIGIN-WISE IMPORTS OF GROUNDNUT CAKE AND MEAL

('000 metric tons)

Imports from	1965	% of total	1966	% of total	1967	% of total
Brazil	2367	(6.38)	32981	(47.34)	13911	(24.63)
China	6066	(16.34)	1432	(2.05)	3915	(6.93)
India	25548	(68.83)	27870	(40.00)	32462	(57.48)
U.S.A.	969	(2.61)	5037	(7.23)	4817	(8.53)
Others	2165	(5.84)	2351	(3.38)	1374	(2.43)
Total	37115	(100.0)	69671	(100.0)	56479	(100.0)

Source: Japan: Ministry
Indian Embassy)

Table 6: JAPAN - ORIGIN-WISE IMPORTS OF COTTONSEED CAKE AND MEAL

('000 metric tons)

Imports from	1965	% of total	1966	% of total	1967	% of total
India	2066	(66.64)	3415	(33.51)	50	(1.55)
Mexico	525	(16.93)	4858	(47.67)	-	-
U.S.A.	509	(16.43)	1028	(10.09)	50	(1.55)
Brazil	-	-	795	(7.80)	-	-
China	-	-	-	-	3118	(96.90)
Others	-	-	95	(0.93)	-	-
Total	3100	(100.0)	10191	(100.0)	3218	(100.0)

Source: Japan - Ministry of Foreign Trade (Trade Returns from
Indian Embassy)

Indian exports of groundnut meal have accounted for a relatively large proportion of Japanese imports of this product. It will be seen that Indian exports of groundnut meal to Japan have been increasing steadily, though they are well below the peak level of 57,490 tons in 1963-64.

In regard to cottonseed cake, imports of this commodity have been relatively unimportant in the case of Japan. Japan is herself a large crusher of imported cottonseed. In 1967, India did not export cottonseed cake to Japan; this as pointed out earlier, was the experience of other traditional importers in the West European markets where it had been received favourably.

Having examined long term demand prospects for oilcakes in Japan, India can certainly look to this market for increased exports of both groundnut extractions as well as cottonseed cake, if only these are consistently available on a competitive basis.

Commercial Practices
and Factors Affecting
India's exports of
Oilcakes to Japan

Almost all imports of oilseeds, and oilseed cake and meal are channelised through Japanese trading companies, except for ZENKOREN which has established direct contact with overseas shippers. All requirements of oilseed cake and meal by the feed manufacturers are bought on c.i.f. Japanese port basis. The oilseeds, feed grain and oilcakes business is concentrated in the hands of a few large Japanese firms viz. Mitsui or Mitsubishi. These trading companies act as agents in which case they charge a commission of 1 percent of invoice value, and intense competition between shippers themselves often results in a lower percentage commission charge. In the case of Indian oilcakes especially, and for feedstuffs in general, these Japanese trading companies often buy on their own and undertake to sell it to local Japanese feed manufacturers.

The importers are grouped in two important Associations - namely the Japan Oil & Fat Importers & Exporters Association and the Japan Feed Trade Association. Names and addresses of the more important firms are listed elsewhere.

In the case of Indian oilcakes Japanese firms use the London Cattle Food Trade Association Contract No.15.

The Japanese Government has specified quality of ingredients to be used in compound feed manufacture in the Japanese Compound Feeds Law. Under this law, strict quality specifications are laid down for the manufacture of compound feeds. The most restrictive clause is that groundnut meal of more than 7 percent fibre content cannot be used in mixed feeds. Since most Indian extractions have a much higher fibre ratio, Indian exporters find it difficult to meet Japanese specifications. There are no administrative or government regulations in regard to quality of imports. Hence we find that India has been able to effect substantial exports to Japan in the past, when quality in terms of fibre was the same as it is presently. This suggests that a high fibre content relative to that of other oilseed cakes - soyabean - does not debar India from the Japanese feedstuffs market, the mixed feed manufacturer can overcome high fibre content problem when it suits him price-wise to do so.

All oilcake other than soyabean imports are under the Automatic Approval System, i.e. imports are more or less freely licenced. However, this does not mean that they are free of import duty. Soyabean cake falls under the Import Quota System (soyabean meal is at present subject to a quota of 30,000 tons to be raised to 50,000 tons by 1st January 1972) at the same time an import levy of 5 percent ad valorem has been imposed, this has been done mainly to protect domestic crushing of soyabean. (One U.S.D.A. publication states that soyabean and peanut cakes are subject to quotas, and the same is true in the case of fishmeal, source: U.S.D.A. Foreign Agriculture Circular; FFO 10-68, July 1968).

Japanese ports are equipped with bulk handling facilities. The major oilseed processors as well as the compound feed manufacturers have moved to coasts or harbours and the result is that transport is both cheap and quick. Some of the Japanese processors in their trade with the U.S. - soyabean - use their own vessels acquired through cheap loans and government assistance. Conference lines are not used in either cakes or bean transport; those who do not have their own ships invariably charter. Freight costs are \$ 7 from Gulf Ports to Japanese

ports when freight is moved by their own vessels; in the case of tramps this works out to \$ 10; the shipping time period is 28 days. Oilcake is transported from processing mills to feed manufacturers mainly by barges and lighters carrying 500 to 800 tons load. Movement in the interior is by dump trucks to the extent of 50 percent, the remaining 50 percent is still transported in bagged form.

In our discussions with the trade and industry, we found that opinion on quality of Indian groundnut extractions was divided. However, it appeared that price played a very important role in the Japanese feed-mix industry set up; the importer had to be guided mainly by price having established a confidence on quality supplied by a particular manufacturer or manufacturers in India. Japanese feed manufacturers have been very conscious of the problem of aflatoxin, but as they themselves pointed out, this did not have an adverse impact on their imports from India. Except for some complaints on Indian firms being unable to keep up to the shipping schedules, Japanese traders had no complaints on their trade with India in oilseed cakes and meals. They were totally satisfied with the reliability of Indian manufacturer exporters.

As regards communications, the larger firms dealing with several commodities in India had telex facilities. As already mentioned, these importers have local offices as well as representatives in supplying countries. Engaging the trade of several commodities, resulted in larger turnover and lower costs.

On the question of rice bran exports from India, most traders were of the opinion that there are technical difficulties relative to these of wheat bran suppliers (U.S.A. and Canada) which are a serious hurdle to increased imports from India. Though Japan uses large quantities of bran for her feedstuffs industry, these are mainly rice bran produced domestically, and imported brans of other grains from the U.S.A. and Canada.

The Japan Oilseed Processors Association, as remarked earlier is a very influential body. These interests are naturally averse to increased imports of oilcakes from any origin.

The most important obstacle to our trade in oilcakes with Japan, it was repeatedly pointed out to us, was the uncertainty of supply. The Japanese mixed feed producer has to use a consistent meal component in his product - consistent in quality and consistent in basic characteristics. A change

in these would make their livestock go off the feed - a risk, few manufacturers would like to take.

A point we would like to make is that our commercial representative in Japan had made considerable efforts to promote this particular commodity. His influence was evident in our meetings with the industry and trade. As pointed out elsewhere and which the trade in Japan believes - India really had very little cake to supply Japan taking into account her production and her bilateral commitments. Japanese traders did not think they could compete with the state trading organisations of Eastern Europe for limited supplies.

Summing-up

Japan, though a very important consumer of oilseed cake and meal, has a limited import demand for oilcakes. This is mainly the result of large scale imports of oilseeds which are processed domestically and also consumed directly as a human food item. Nonetheless, she does undertake imports of around 100,000 tons per annum. Japan is a large potential

market for oilcakes as such because of limited growth prospects for vegetable oils and fats demand and a rapid growth in the production of meat and dairy products output envisaged by Japanese authorities. Since Japanese feed manufacturers do use both groundnut and cottonseed extractions, India should cultivate this market. Strict adherence to quality specifications and competitive prices should enable us to exploit the market more fully than at present.

	1960	1961	1962	1963	1964	1965	1966	1967
Copra Meal and Cake	24.6	31.3	28.0	35.6	32.3	32.3	34.6	40.1
Cottonseed cake	42.7	43.2	67.3	33.7	100.2	120.5	134.2	125.7
Kapok seed cake	24.7	23.6	31.2	31.4	25.5	43.0	35.1	20.5
Kardiseed cake	56.6	51.0	40.0	100.7	147.9	68.6	69.2	93.8
Linseed cake	52.1	63.3	49.3	53.4	59.3	59.3	67.3	65.0
Palm Kernel cake	13.0	12.8	13.7	13.9	11.9	10.7	10.1	9.1
Peanut cake	-	-	-	33.0	66.4	43.5	75.0	61.8
Rapeseed/Mustard cake	125.0	142.5	124.0	95.6	102.2	103.7	164.9	170.0
Sesamum seed cake	9.3	4.9	5.9	3.3	9.3	9.7	10.6	11.6
Soyabean meal & cake	702.4	759.2	747.4	927.9	977.7	1060.6	1139.3	1216.0
Sunflowerseed cake	14.2	9.7	11.7	13.4	0.3	2.3	1.6	36.3
Other cakes & meals	16.2	40.3	15.0	25.3	23.5	77.0	72.3	22.3

Sub-Total

1030.3 1192.3 1134.5 1433.7 1562.5 1637.7 1865.7 1872.7

Fish Meal

13.1 18.4 33.4 80.7 96.1 99.5 79.8 70.5

Total

1093.9 1211.2 1167.9 1514.4 1658.6 1737.2 1945.5 1943.2

Total available for
Animal Feedstuffs ^{2/}

793.9 911.2 867.9 1214.4 1358.6 1437.2 1645.5 1643.2

Source: Production; The Japan Oil & Fat Importers & Exporters Association; Bulletin of Statistics for Oilseeds & Oilcakes; Tokyo 1967 Imports: ISTA OILWORLD.

1/ Production of oilcakes in organised sector only Domestically produced rapeseed which is crushed in unorganised sector is excluded. Imports of oilcakes are added to the production data to give net availability.

2/ Since Japan uses soyabean meal for food articles and fertiliser to the extent of 300,000 tons, we have deducted this figure from net available oilseed cake and meals. This gives total net availability of high protein oilcakes and meal for animal feedstuffs.

ANNEXURE TABLE 1-B : JAPAN : PROTEIN EQUIVALENT OF OILSEED CAKE & MEAL

('000 metric tons)

1960 1961 1962 1963 1964 1965 1966 1967

Copra	5.4	7.0	6.1	8.0	7.2	7.2	7.6	8.8
Cottonseed	17.5	19.8	27.8	36.4	41.1	49.4	55.0	51.5
Kapok seed	9.1	10.6	11.5	11.6	9.4	15.9	13.0	7.6
Kardiseed	20.9	18.9	14.8	37.3	54.7	25.4	25.6	34.7
Linseed	18.7	23.0	17.9	21.0	21.3	21.5	24.4	23.4
Palm Karnel	2.3	2.3	2.5	2.5	2.1	1.9	1.8	1.6
Peanut	-	-	-	17.2	34.5	19.7	39.6	32.1
Rapeseed/Mustard	45.0	51.3	44.6	34.4	36.8	39.1	59.4	61.2
Sesamum seed	3.7	2.0	2.4	3.3	3.7	3.9	4.2	4.6
Soyabean 1/	135.1	211.2	205.8	233.3	311.7	349.9	409.3	421.4
Sunflower seed	5.2	3.5	4.3	5.0	0.3	1.0	0.6	13.6
Others	6.0	14.9	5.5	9.5	10.5	28.5	26.9	8.2
Fish Meal	8.5	12.0	21.7	52.4	62.5	64.7	51.9	45.3

Total 327.4 376.6 364.9 527.4 395.8 623.1 719.3 714.5

Source: See Annexure Table 1-A.

1/ After deducting 300,000 tons of meal used for non-feedstuff purposes.

ANNEXURE TABLE II : JAPAN : CATTLE AND HOGS ON FARMS,

PRODUCTION OF EGGS AND POULTRY MEAT, 1960-65

	1960	1961	1962	1963	1964	1965
Gattle on Farms (million)	3.2	3.2	3.3	3.5	3.4	3.2
Hogs on Farms (million)	1.9	2.6	4.0	3.3	3.5	4.4
Egg Production (million doz.)	797.0	1072.0	1217.0	1275.0	1491.0	1552.0
Poultry Meat (million lbs.)	459.4	109.3	145.8	232.1	300.2	353.6

Source: Commonwealth Economic Committee: Meat; Dairy Product; H.M.S.O., London (Various Issues)

ANNEXURE TABLE III : JAPAN : HIGH PROTEIN ANIMAL CONSUMING UNITS, 1960-65

	1960	1961	1962	1963	1964	1965
Cattle (million)	1.6	1.6	1.6	1.7	1.7	1.6
Hogs (million)	0.9	1.3	2.0	1.6	1.7	2.2
Eggs (million)	5.7	7.7	8.7	9.1	10.6	11.1
Poultry Meat (million)	2.0	0.5	0.6	1.0	1.3	1.6
Total	10.2	11.1	12.9	13.4	15.3	16.5

Source: Annexure Table II.

ANNEXURE TABLE IV : JAPAN : APPARENT CONSUMPTION OF OILCAKE PROTEIN PER ANIMAL UNIT

1960-65

	1960	1961	1962	1963	1964	1965
Protein Consumption ('000 tonnes)	327.4	376.6	364.9	527.4	595.3	623.1
Protein Consumption (million lbs.)	721.3	830.2	804.4	1162.7	1313.5	1384.7
Protein Consuming Units (million)	10.2	11.1	12.9	13.4	15.3	16.5
Consumption per Unit (lbs.)	71	75	62	87	83	84
Oilcake Consumption per Unit (lbs.) ^{1/}	151	170	141	193	195	191

Source: Japan: Supply-Distribution Tables.

^{1/} In terms of 44% Protein.

ANNEXURE TABLE V : JAPAN : PRODUCTION OF COMPOUND FEEDS BY TYPE

(Fiscal year) (in '000 metric tons)								
Type of compound feed.	1960	1961	1962	1963	1964	1965	1966	1967
Poultry	2320 (80.50)	3127 (76.34)	3704 (74.23)	4530 (73.05)	5431 (72.45)	5312 (65.13)	6097 (61.60)	5335 (62.49)
Pigs	-	465 (11.35)	623 (12.53)	875 (14.11)	1157 (15.43)	1774 (21.77)	2552 (25.73)	2237 (23.75)
Calves & Cattle	314 (10.39)	414 (10.11)	536 (10.74)	676 (10.90)	766 (10.22)	881 (10.81)	1049 (10.60)	1133 (12.03)
Other Animals	243 (8.61)	90 (2.20)	122 (2.45)	120 (1.94)	142 (1.90)	133 (2.24)	200 (2.02)	162 (1.73)
Total	2892 (100.0)	4096 (100.0)	4930 (100.0)	6201 (100.0)	7496 (100.0)	8150 (100.0)	9898 (100.0)	9417 (100.0)

Source: Ministry of Agriculture and Forestry, Japan.

Figures in brackets show percentages of actual totals.

ANNEXURE TABLE VI : JAPAN : STRUCTURE OF COMPOUND FEEDING STUFFS BY CONTENTS

(Consumption of raw materials for the manufacture of compound feeds)

(Fiscal Year)
(in thousand metric tons)

	1960	1961	1962	1963	1964	1965	1966	1967
Cereals	1,511,522 (52.42)	2,162,233 (52.18)	2,730,125 (55.27)	3,487,769 (55.57)	4,275,175 (58.22)	4,704,818 (57.46)	5,824,792 (58.57)	5,656,793 (63.34)
Fishmeal	170,554 (5.91)	217,913 (5.26)	243,499 (4.84)	307,957 (4.90)	371,004 (5.05)	345,542 (4.22)	342,109 (3.44)	336,730 (3.77)
Tapioca	-	-	-	-	-	-	-	-
Oilcakes	332,595 (11.53)	458,624 (11.07)	467,942 (9.30)	737,697 (11.75)	916,954 (12.49)	1,000,860 (12.22)	1,369,499 (13.77)	1,241,184 (13.90)
Others	868,930 (30.14)	1,305,166 (31.49)	1,538,193 (30.59)	1,743,419 (27.78)	1,780,261 (24.24)	2,136,917 (26.10)	2,408,725 (24.22)	1,695,862 (18.99)
Total	2,883,601 (100.0)	4,143,936 (100.0)	5,029,759 (100.0)	6,276,842 (100.0)	7,343,434 (100.0)	8,188,137 (100.0)	9,945,125 (100.0)	8,930,569 (100.0)

Source : Ministry of Agriculture and Forestry, Japan.

Figures in brackets show percentages of actual totals.

20. Asia (Burma, Indonesia, Philippines, Pakistan,

Turkey and Syria)

Most of the Asian countries produce a wide range of oilseeds and oil-bearing material and, until recently, accounted for a large share of the world trade in these products. However, at present some eleven Asian countries participate in the world trade in oilcakes, either directly in the form of oilcakes or indirectly in the form of oilseed exports. Among these eleven countries, the bulk of exports is accounted for by India (40-45 per cent of the group total), Philippines (20 per cent), Turkey, Indonesia, Syria and Burma together account for almost the entire balance.

Being countries which are in the category of developing nations, there has been a very perceptible change in the composition of their trade, namely the shift from exporting oilseeds to the products of oilseeds, the most outstanding example being that of India. Demand for vegetable oils has increased very rapidly with the growth in population and rising income levels. Had the animal feeding techniques been developed or had the protein from oilcakes been diverted to direct human consumption, there is hardly any doubt that these countries would not export oilcakes. As it is, compelling foreign exchange shortages make oilcake exports inevitable. The large cattle populations live mainly off hay and grass, hog and poultry production are not of any significant order. Moreover, even these animals live off farm by-products and

waste. Rice-bran and oilcakes are used directly as animal feedstuffs, the compound feed industry at present being inconsequential. It is only recently that livestock and dairy products development alongwith the growth of large urban industrial centres is finding a place in the planned programme of economic development.

Since we have already examined the production of oilseeds and the oilcake export trade from India, the analysis below confined to the six other important oilcake exporting countries. The Annexure Tables A to I give the combined supply distribution, for oilseeds and oilcakes for the six countries mentioned above. Among, Asian countries, the island of Hong Kong does undertake imports of a very limited quantity of oilcake. However, the scope for expansion in livestock production in this country appears extremely limited, except in the case of poultry. Almost all the meat requirements of Hong-Kong are met by way of imports from China (Mainland), Australia and Newzeland. As Annexure Tables B and F show, none of the important Asian countries undertake any significant quantity, of oilcake imports.

Production of oilseeds in the six Asian countries shows a tardy growth of 3.3 per cent per annum (on an average) between 1960 and 1966. Production of oilseeds increased from 4.8 to 5.7 million tonnes over the same period. Techniques of production continue to remain more or less traditional. Yields are relatively low and except in the case of Turkey's cottonseed, there has been no improvement in yield over the

past several years. Again, given the fact that most of these countries are deficient in foodgrains, it is difficult to divert the acreage from foodgrains to cash crops like oilseeds. In fact, it will be observed that, as in the case of India, commercial crops have not received the benefits of planned investment.

Copra production, fluctuating between 1.9 and 2.0 million tonnes, is the most important oilseed produced in this group of six countries. Almost the entire copra output is accounted for by the Philippines and Indonesia. Cottonseed output gained very rapidly from 1.1 million tonnes in 1960 to 1.7 million tonnes in 1966. The third most important oilseed is groundnuts. Production over the six year period, in the three oil bearing material account for slightly over 60 per cent of the total oil bearing materials produced in this group of countries. Among the less important oilseeds, production of soyabeans, rapeseed and mustard, linseed and palm kernel remained more or less stable whilst that of sunflower seed showed a marked growth, from 130,000 tonnes in 1960 to 207,000 tonnes in 1966.

Copra is by far the most important export oilseed from this group of countries and accounts for slightly 90 per cent of total exports of oilseeds. Cottonseed exports exhibit a marked year-to-year variations but do not exceed 60,000 tonnes in any single year over the 1960 to 1966 period. Except for palm kernel among other oilseeds which average 30,000 tonnes per annum, all other oilseeds exports are less than 10,000 tonnes each. On the whole, exports of oilseeds have shown a decline from 1.3 million tonnes in 1960 to 1.1 million tonnes in 1966.

Except for imports of 14 to 16,000 tonnes of soyabean meal, none of the six countries undertake oilcake imports. Table G shows the exports of oilcake and meal from these countries. Oilcake exports, though they show an overall increase over the 1960 to 1966 period from 0.6 to 0.9 million tonnes, have been more or less stable over the 1963 to 1966 period. Among the different oilcakes exported, copra has emerged as the most important accounting for 40 per cent of total oilcake exports in 1966. Copra cake exports have shown a very marked uptrend from 187,000 tonnes in 1960 to 323,000 tonnes in 1966. Similar is the case with cottonseed cake whose exports doubled from 110,000 tonnes in 1960 to 208,000 tonnes in 1966. The highest growth, however, occurred in the case of sunflowerseed cake which is a relatively new oilseed produced in this group; sunflowerseed cake exports rose from 51,000 tonnes in 1960 to 203,000 tonnes in 1966. Exports of groundnut cake, however, have trended downward very sharply from 117,000 tonnes in 1960 to 49,000 tonnes in 1966. Other oilcake exports remained unimportant. On the whole, a higher proportion of the oilcake produced in these countries is being exported; thus between 1960 and 1966, whilst domestic production of oilcakes increased by 31 per cent, exports increased by 50 per cent. The fall in oilseeds exports has thus been made up by exports of oilcakes.

Asia (Burma, Indonesia, Philippines, Pakistan, Turkey, Syria)

TABLE A : PRODUCTION OF OILSEEDS

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut <u>u/</u>	502.5	595.3	720.3	673.5	713.2	872.1	929.0
Soyabean	449.1	430.8	401.4	357.7	405.4	411.5	391.2
Cottonseed	1127.8	1272.0	1438.6	1552.4	1617.4	1658.2	1709.6
Sunflower seed	130.0	103.6	67.1	94.5	171.7	166.6	207.3
Rape/Mustard	314.9	315.0	366.8	306.9	313.9	284.5	312.9
Linseed	28.5	30.5	34.5	33.5	32.5	28.9	30.3
Sesamum	144.3	161.6	166.5	131.0	141.2	126.0	133.0
Palm kernel	32.5	34.5	32.5	32.5	34.5	33.5	34.0
Copra	1936.8	1847.0	1783.0	1968.4	1890.4	2139.3	1900.3
Total	4766.4	4790.3	5010.7	5150.4	5320.2	5720.6	5647.6

Source : Supply-Distribution Tables, Burma, Indonesia, Philippines, Pakistan, Turkey, Syria.

u/ = unshelled

ASIA (BURMA, INDONESIA, PHILIPPINES, PAKISTAN, TURKEY, SYRIA)

TABLE-B : IMPORT OF OILSEEDS
(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	-	-	-	51.8	-	-	-
Soyabean	1.0	2.0	-	5.1	6.1	5.6	5.6
Cottonseed	-	-	-	-	-	-	-
Sunflowerseed	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	11.1	20.4	18.0
Linseed	-	-	-	-	-	-	-
Sesamum	2.0	3.0	3.0	4.0	4.0	1.5	2.7
Palm kernal	-	-	-	-	-	-	-
Copra	8.1	10.1	9.1	5.0	6.1	1.0	1.0
Total	11.1	15.1	12.1	14.1	79.1	28.5	27.3

ASIA (BURMA, INDONESIA, PHILIPPINES, PAKISTAN, TURKEY, SYRIA)

TABLE-C : EXPORT OF OILSEEDS

in '000 tonnes

	1960	1961	1962	1963	1964	1965	1966
Groundnut	10.1	8.1	8.1	5.1	4.0	5.1	4.7
Soyabean	4.1	3.0	4.0	3.0	3.0	1.2	5.4
Cottonseed	38.6	48.8	56.9	58.9	32.5	57.7	19.0
Sunflowerseed	7.1	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-
Linseed	9.1	1.0	-	-	2.0	0.7	-
Sesamum	1.4	2.8	2.2	2.1	2.5	2.3	1.8
Palm Kernel	33.5	32.5	31.5	31.5	30.5	32.9	31.5
Copra	1194.8	1166.4	946.9	1050.6	983.5	1003.3	1083.1
Total	1298.7	1262.6	1049.6	1151.2	1058.0	1103.2	1145.5

ASIA (BURMA, INDONESIA, PHILIPPINES, PAKISTAN, TURKEY, SYRIA)

TABLE-D : OILSEEDS AVAILABLE FOR CRUSHING

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut s/	411.6	408.6	496.1	466.3	547.0	605.4	645.6
Soyabean	446.0	429.8	397.4	359.8	408.5	415.9	391.4
Cottonseed	1089.2	1223.2	1381.7	1493.5	1584.9	1600.5	1690.6
Sunflowerseed	122.9	103.6	67.1	94.5	171.7	166.6	207.3
Rape/Mustard	314.9	315.0	366.8	306.9	325.0	304.9	330.9
Linseed	19.4	29.5	34.5	33.5	30.5	28.2	30.3
Sesamum	144.9	161.8	167.3	132.9	142.7	125.2	133.9
Palm Kernel	-1.0	2.0	1.0	1.0	4.0	0.6	2.5
Copra	750.1	690.7	845.2	922.8	913.0	1137.0	818.2
Total	3298.0	3364.2	3757.1	3863.0	4075.5	4384.2	4250.7

Source : Derived from Tables A, B and C.

Note : Negative supply balances shown are due to variations in stock levels which could not be accounted for while constructing these tables.

ASIA (BURMA, INDONESIA, PHILIPPINES, PAKISTAN, TURKEY, SYRIA)

TABLE-E : OILCAME EQUIVALENT OF OILSEED CRUSHED

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	230.5	228.8	277.8	261.1	306.3	339.0	361.5
Soyabean	352.3	339.5	313.9	284.2	322.7	328.6	309.2
Cottonseed	457.5	513.7	580.3	627.3	665.6	672.2	710.0
Sunflowerseed	82.3	69.4	44.9	63.3	115.0	111.6	133.9
Rape/Mustard	173.2	173.2	201.7	168.8	178.7	167.7	182.0
Linseed	12.4	13.9	22.1	21.4	19.5	18.0	19.4
Sesamum	75.2	84.0	86.9	69.0	74.0	65.0	69.6
Palm Kernel	70.5	1.0	0.5	0.5	2.1	3.1	1.3
Copra	262.5	241.7	295.3	323.0	319.5	397.9	286.4
Total	1645.1	1670.1	1823.3	1847.3	1974.3	2100.0	2077.9

ASIA (BURMA, INDONESIA, PHILIPPINES, PAKISTAN, TURKEY, SYRIA)

TABLE-F : IMPORT OF OILCAKES

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	-	-	-	-	-	-	-
Soyabean	0.5	1.6	0.1	4.4	1.8	16.7	14.3
Cottonseed	-	-	-	-	-	-	-
Sunflowerseed	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-
Sesamum	-	-	-	-	-	-	-
Paln kernel	-	-	-	-	-	-	-
Copra	-	-	-	-	-	-	-
Total	0.5	1.6	0.1	4.4	1.8	16.7	14.3

ASIA (BURMA, INDONESIA, PHILIPPINES, PAKISTAN, TURKEY, SYRIA)

TABLE-G : EXPORT OF OILCAKE

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut s/	116.8	142.3	156.8	164.8	94.1	41.9	49.3
Soyabean	-	-	-	-	-	-	-
Cottonseed	109.6	106.6	147.2	157.2	168.3	189.2	208.1
Sunflowerseed	51.4	68.4	90.0	99.7	131.0	183.9	203.4
Rape/Mustard	25.7	13.7	23.2	20.5	16.0	17.0	19.3
Linseed	-	-	-	-	-	-	-
Sesamum	11.5	19.3	24.5	25.0	4.4	14.2	10.0
Palm kernel	-	-	-	-	-	-	-
Copra	187.3	238.0	192.5	251.9	351.2	310.7	323.2
Others	88.1	112.7	130.2	119.6	97.0	100.3	57.5
Total	590.4	701.0	764.4	838.7	852.0	857.2	870.3

Source : Table I below

TABLE-H : NET AVAILABILITY OF OILCAKES AND MEAL

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	113.6	86.5	121.0	125.3	183.2	297.1	312.2
Soyabean	353.8	341.1	314.0	288.6	324.5	345.2	323.5
Cottonseed	347.3	407.1	433.1	470.1	497.3	483.0	501.9
Sunflowerseed	30.9	1.0	-45.1	-36.4	-16.0	-72.3	-64.6
Rape/Mustard	147.4	159.5	178.5	143.2	162.7	150.6	162.6
Linseed	12.4	18.3	22.0	21.4	19.5	18.0	19.3
Sesamum	63.7	54.7	62.4	44.0	69.6	50.3	59.6
Palm Kernel	-0.5	1.0	0.5	0.5	2.0	0.3	1.3
Copra	75.2	3.7	103.3	71.0	-31.7	87.2	-36.9
Others	-88.1	-112.7	-130.2	-119.6	-97.0	-100.3	-57.5
Total	1055.2	970.7	1059.5	1013.0	1114.1	1259.5	1221.4

Source : Tables E, F and G

Note: Negative supply balances are due to variations in stock which could not be accounted for while construction these tables, or due to differences in reporting trade data by the countries concern.

TASIA (BURMA, INDONESIA, PHILIPPINES, PAKISTAN, TURKEY, SYRIA)

TABLE-I : RAW PROTEIN CONTENT OF NET AVAILABILITY OF CAKES

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	59.0	44.9	62.9	65.1	95.2	154.4	162.3
Soyabean	162.2	156.9	144.4	132.7	149.2	158.7	148.8
Cottonseed	142.5	166.9	177.5	192.7	203.8	198.0	205.7
Sunflowerseed	11.4	0.3	-16.6	-13.4	-5.9	-26.7	-23.9
Rape/Mustard	53.0	57.4	64.2	53.3	58.5	54.2	58.5
Linseed	4.4	6.7	7.9	7.7	7.0	6.4	6.9
Sesamum	25.5	25.9	25.0	17.6	27.8	20.3	23.8
Palm Kernel	-	0.1	-	-	0.3	-	0.2
Copra	16.5	0.8	22.7	15.6	-6.9	19.1	-8.1
Others	-32.5	-41.6	-48.1	-44.2	-35.8	-37.1	-21.2
Total	442.0	418.3	439.9	427.1	493.2	547.3	553.0

Source : Derived from Table H.

21. A F R I C A

Africa is an important source of high protein feedstuffs for livestock in Western Europe. The major producing countries of Africa have developed close trading relationships with the ECM countries under the preferential treatment accorded to the Associated Territories. Export of oilcakes from the African countries has increased considerably over the 1960 to 1967 period. Oilcake exports including cake equivalent of oilseeds, increased by 0.5 million tonnes to 1.9 million tonnes over the same period. With the growth of the oilseeds processing industry in the major oilseed producing countries, African exports of end-products of oil-bearing materials increased at a faster rate than did oilseed exports. Exports of oilcakes as such increased by 66 percent from 0.6 million tonnes in 1960 to nearly one million tonnes in 1967. Quite a large part of the investment into the oilseeds processing industry in Africa is of the European origin; the rise in processing costs of oilseeds in the advanced countries relative to costs in the producing countries has encouraged the process. As against small uneconomic units in India, the recent development of the industry in Africa has allowed for the installation of modern large-scale improved equipment and plants.

Though some 17 African countries participate in the oilcake trade of this region, only a limited number of countries undertake large exports. In 1967, only three countries - Nigeria, Senegal and

Sudan - accounted for 70 percent of total African oilcake exports. The supply distribution tables - Annexure - take into account only five principal countries, namely, Egypt, Uganda, Senegal, Sudan and Nigeria. -Of the various oilseeds - groundnuts, cottonseed and palm dominate production and the export trade. Groundnuts account for 60 percent of the oilseeds produced in these countries. Cottonseed comes next in importance, its share being around 25 percent. Production of palm kernel - an important oil bearing material of the region - has tended to stagnate. High capital costs for this perennial tree crop is relatively high whereas prices of palm oil have trended downward over the last few years. Production of sesamum has also been more or less stable at around 200,000 tonnes per annum. Africa does not import oilseeds.

Table C of the Annexure gives the export data for oilseeds from the five countries combined. After a sharp upward, shift in oilseed exports between 1960 and 1961, exports have tended to remain more or less stable at 1.6 million tonnes per annum. Groundnut is the most important oilseeds exported and this alone accounted for slightly over 60 percent of the total exports. Exports of palm kernel remained steady at around 400,000 tonnes.

Exports of oilcakes from the five countries, it will be observed from the Annexure tables, recorded a sharp uptrend, the increase occurring over every alternate year. As in production of oilseeds,

exports of groundnut cake account for over 60 percent of the total cake exported, cottonseed is the next in importance and shows a similar rapid growth. Exports from these countries are largely in the form of expeller cake. No breakdown of data for exports in the form of extractions and expeller cake is available. The country reports on Nigeria and Senegal deal with the processing industry and the quality of the oilcakes produced in the two countries. Exports of groundnut cake increased by 130,000 tonnes between 1960 and 1966 when it touched the level of 348,000 tonnes. Cottonseed cake exports rose from 131,000 tonnes in 1960 to 214,000 tonnes in 1966.

Production of different oilseeds in Africa has been influenced by several factors. Production of palm kernel - being a perennial product has been stable. Large investments to develop the plantation type of industry which was the basis of growth in earlier years is not forthcoming in view of the adverse price trends for oil in the past few years. Production of cottonseed is influenced more by the world demand for African cotton than by any other single factor. Production of peanuts has increased rapidly mainly as a result of favourable demand in world markets with the withdrawal of such major suppliers like India. Peanuts are the most important cash crop in the major producing countries. The expansion is almost entirely due to increased acreage under the crop, yields have remained more or less stagnant. The scope for bringing in additional acreage under

cultivation in Nigeria, Senegal and Sudan is substantial. At present the Governments of these countries, are interested in encouraging expansion in the acreage devoted to foodgrains. In Senegal, for example, the Government has developed a plan to stabilise the acreage under peanuts whilst encouraging foodgrains production. This, however, is a problem that most developing countries are faced with; on the one hand the need for foreign exchange and increased exports is stressed whilst on the other low per capita foodgrains availability requires priority to the foodgrains producing sector.

In the major groundnut producing countries, Marketing Boards operate in order to ensure the farmer adequate and stable returns. Each year, the Boards declare the prices at which they would purchase groundnuts and also make allocations to the local processing industry. Exports of oilseeds are undertaken by the Boards themselves. Prices for groundnut exports are pre-determined between the importers in the ECM countries and the Marketing Board under the Youande Convention.

In the past year or two, exports from Nigeria have, to a certain extent, been influenced by the political disturbances in the area. Inadequate transport facilities in the region is also a limiting factor in African oilcake and vegetable oil export trade. Domestic demand for vegetable oils which has been increasing rapidly is

bound to encourage the domestic processing rather than exports of oil-seeds. Domestic demand for oilcakes as an animal feed, is, however, unlikely to increase very rapidly over the next 5 - 7 years and the bulk of this produce would find its way into the export trade as observed in the past. There is no information on the compound feed industry in Africa. It is unlikely, however, that any sophisticated feeding techniques have at all been developed. Prof. Berg in his study of the oil bearing materials for the Congo, Nigeria and Senegal placed the groundnut meal exports (including meal equivalent of seeds) at 1.1 million tonnes by 1975^{1/} as against 0.85 million tonnes in 1966. On the basis of the past performance, one may however, visualise a higher growth rate of say 6 - 7 percent. On this basis, exports of groundnut meal could rise to 1.3 to 1.4 million tonnes per annum.

Country reports are presented subsequently in the case of Nigeria and Senegal - the two most important oilcake exporting countries in Africa.

^{1/} Berg, Eric. R.: Nigeria, Senegal and the Congo: Projected Level of Demand, Supply and Exports of Oilseed Products to 1975 with Implications for U.S. Exports. To the European Economic Community: University of Alberta Edmonton, Alberta, January, 1967.

ANNEXURE TABLES

AFRICA (EGYPT, SUDAN, UGANDA, NIGERIA, SENEGAL)

TABLE - A: Production of Oilseed

	(In '000 tonnes)						
	1960	1961	1962	1963	1964	1965	1966
Groundnut	2101.1	2224.1	2462.8	2403.3	2333.8	2850.8	2740.0
Soyabean	14.2	15.2	27.4	11.2	19.3	19.3	15.2
Cottonseed	1377.4	1234.4	1452.7	1330.2	1500.3	1552.1	1337.5
Sunflowerseed	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-
Linseed	9.1	12.2	11.2	11.2	14.2	10.0	11.0
Sesamum	200.1	295.6	209.1	249.8	279.4	225.1	186.6
Castorseed	-	-	-	-	-	-	-
Palm Kernel	432.9	442.0	368.8	424.7	411.5	426.1	228.0
Copra	7.1	3.0	2.0	3.0	8.1	-	-
Total	4141.9	4226.5	4534.0	4460.4	4566.6	5083.4	4518.3

AFRICA (EGYPT, SUDAN, UGANDA, NIGERIA, SENEGAL)

TABLE - B: IMPORTS OF OILSEEDS

	(in '000 tonnes)						
	1960	1961	1962	1963	1964	1965	1966
Groundnut	-	-	-	-	-	-	-
Soyabean	-	-	-	-	-	-	-
Cottonseed	-	-	15.2	16.2	-	28.2	-
Sunflowerseed	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-
Linseed	2.0	-	-	-	-	-	-
Sesamum	6.1	12.2	15.2	9.1	7.1	5.0	8.0
Castorseed	-	-	-	-	-	-	-
Palm Kernel	-	-	-	-	-	-	-
Copra	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-
Total	8.1	12.2	30.4	25.3	7.1	33.2	8.0

AFRICA (EGYPT, SUDAN, UGANDA, NIGERIA, SENEGAL)

TABLE - C: EXPORTS OF OILSEEDS

	(in '000 Tonnes)						
	1960	1961	1962	1963	1964	1965	1966
Groundnut	669.6	860.5	933.6	945.9	917.5	898.1	997.4
Soyabean	3.1	14.2	15.2	27.4	8.1	15.4	12.3
Cottonseed	141.4	200.2	264.0	181.5	115.5	137.0	112.1
Sunflowerseed	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-
Sesamum	103.6	87.3	106.7	88.3	126.0	92.9	99.9
Castorseed	-	-	-	-	-	-	-
Palm Kernel	424.7	417.6	372.9	404.4	400.3	422.2	400.3
Copra	7.1	3.0	2.0	3.0	8.1	-	-
Others	-	-	-	-	-	-	-
Total	1349.5	1582.8	1694.4	1650.5	1575.5	1565.6	1622.0

AFRICA (EGYPT, SUDAN, UGANDA, NIGERIA, SENEGAL)

TABLE - D: OILSEEDS AVAILABLE FOR CRUSHING

	(in '000 tonnes)						
	1960	1961	1962	1963	1964	1965	1966
Groundnut	801.0	696.0	790.2	755.1	715.9	1097.3	920.2
Soyabean	11.1	1.0	12.2	-16.2	11.2	3.9	2.9
Cottonseed	1236.0	1034.2	1203.9	1164.9	1384.8	1443.3	1225.4
Sunflowerseed	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-
Linseed	11.1	12.2	11.2	11.2	14.2	10.0	11.0
Sesamum	102.6	220.5	117.6	170.6	160.5	137.2	94.7
Palm Kernel	8.2	24.4	-4.1	20.3	11.2	3.9	-172.3
Copra	-	-	-	-	-	-	-
Total	2170.0	1988.3	2131.0	2105.9	2297.8	2695.6	2081.9

AFRICA (EGYPT, SUDAN, UGANDA, NIGERIA, SENEGAL)

TABLE - E: OILCAKE EQUIVALENT OF OILSEED CRUSHED

	('000 tonnes)						
	1960	1961	1962	1963	1964	1965	1966
Groundnut	443.4	389.5	442.2	422.6	400.7	614.2	515.1
Soyabean	8.7	0.7	9.6	-12.7	8.8	3.0	2.2
Cottonseed	519.0	434.4	503.3	489.1	581.4	606.0	514.5
Sunflowerseed	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-
Linseed	7.1	7.8	7.1	7.1	9.0	6.4	7.0
Sesamum	53.2	114.5	61.1	88.5	83.2	71.2	49.2
Palm Kernel	4.2	12.6	-2.1	10.5	5.7	2.0	-89.6
Copra	-	-	-	-	-	-	-
Total	1040.6	959.5	1023.2	1005.1	1088.8	1302.8	998.4

AFRICA (EGYPT, SUDAN, UGANDA, NIGERIA, SENEGAL)

TABLE - F: IMPORTS OF OILCAKES AND MEAL

	(in '000 tonnes)						
	1960	1961	1962	1963	1964	1965	1966
Groundnut							
Soyabean							
Cottonseed							
Sunflowerseed							
Rape/Mustard				N	I	L	
Linseed							
Sesamum							
Castorseed							
Palm Kernel							
Copra							
Total							

AFRICA (EGYPT, SUDAN, UGANDA, NIGERIA, SENEGAL)

TABLE -- G: EXPORTS OF OILCAKE & MEAL

	(in '000 tonnes)						
	1960	1961	1962	1963	1964	1965	1966
Groundnut	217.5	256.6	270.4	264.5	364.6	328.8	347.5
Soyabean	-	-	-	-	-	-	-
Cottonseed	131.4	115.5	118.2	172.6	172.3	197.5	214.4
Sunflowerseed	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-
Linseed	-	-	-	8.6	6.0	6.5	6.0
Sesamum	12.9	33.3	17.3	13.5	22.3	23.9	25.2
Castorseed	-	-	-	-	-	-	-
Palm Kernel	1.0	0.9	0.9	1.3	2.2	4.0	34.8
Copra	-	-	-	-	0.6	0.6	0.4
Others	12.4	22.7	12.9	18.9	19.2	26.1	25.2
Total	375.2	429.0	419.7	479.4	587.2	587.4	653.5

AFRICA (EGYPT, SUDAN, UGANDA, NIGERIA, SENEGAL)

TABLE - H: NET AVAILABILITY OF OILCAKE
AND MEAL

	(in '000 tonnes)						
	1960	1961	1962	1963	1964	1965	1966
Groundnut	230.9	132.9	171.8	158.1	36.1	285.4	167.6
Soyabean	8.7	0.7	9.6	-127.0	8.8	3.0	2.2
Cottonseed	387.6	318.9	387.1	316.5	409.1	408.5	300.1
Sunflowerseed	-	-	-	-	-	-	-
Rape/Mustard	-	-	-	-	-	-	-
Linseed	7.1	7.8	7.2	-15.0	3.0	-0.1	1.0
Sesamum	40.3	81.2	43.8	75.0	60.9	47.3	24.0
Palm Kernel	3.2	11.7	-3.0	9.2	3.5	-2.0	-124.4
Copra	-	-	-	-	-0.6	-0.6	-0.4
Others	-124.0	-227.0	-129.0	-189.0	-192.0	-261.0	-252.0
Total	665.4	530.5	603.5	525.7	501.6	715.4	344.9

AFRICA (EGYPT, SUDAN, UGANDA, NIGERIA, SENEGAL)

TABLE - I: RAW PROTEIN EQUIVALENT OF OILCAKES
AND MEAL

(in '000 tonnes)

	1960	1961	1962	1963	1964	1965	1966
Groundnut	120.1	69.3	89.4	82.3	18.9	148.5	87.3
Soyabean	4.0	0.3	4.4	-5.8	4.0	1.3	1.0
Cottonseed	158.9	130.7	158.8	129.8	167.8	167.5	123.0
Linseed	2.5	2.8	2.5	-0.5	1.0	-	0.3
Sesamum	16.1	32.5	17.5	30.0	24.4	18.9	9.6
Palm Kernel	0.5	2.1	0.5	1.6	0.6	-0.3	-22.3
Others	-4.5	-8.3	-4.7	-6.9	-7.1	-9.6	-9.3
Total	297.6	229.4	267.4	230.5	209.5	326.2	189.6

Source: SS - Distribution Tables, Egypt, Sudan, Uganda, Nigeria, Senegal.

S/ Shelled U/ Unshelled

22 N I G E R I A

Nigeria is an important oilseeds producing country. A substantial part of the oil bearing material produce like palm kernels, groundnut and cottonseeds and cake are exported. The cake that is exported is of the expeller variety. There are no extraction units in this country.

Groundnut is grown primarily in the Northern region where there is not much of rainfall - average about 35" a year. The normal sowing starts around June - July and harvesting by November. The acreage under cultivation has been gradually increasing at about 2 percent every year, however, the yield per acre has not gone up much and is about 650 pounds per acre. Supply distribution tables show production and availability of oilcakes in Nigeria.

The groundnut growing fields are owned by small farmers. This cash crop was assured of a guaranteed minimum price, hence production went up till 1966. The normal procedure in this country is that the entire produce of groundnut excepting about 155,000 T/year which is used as re-sowing seeds, local consumption etc., is purchased by a Government controlled Marketing Board which distributes the groundnuts to the various consumers. The Marketing Board fixes a price for the produce every season. For example it was 42 N.£/Ton for 1967-68 crop, this year. Once the price is fixed, the Marketing Board covers a profit in years when the world market price is higher

and these profits are made use of as a reserve to compensate for the loss during the years when the world market prices fall. However, the Board has in the past invested such reserve in liquid loans of the Government and is not easily getting back the money for distribution. This has led the board to go on decreasing the price to the producer. The purchases are through agents and naturally a portion of this amount goes to the agents and the rest only goes to the farmer. The purchase is that of the decorticated nuts only. The decortication is done in the fields by small hand operated machines which are fairly efficient. The percentage of broken kernels now is far less than when they were decorticated by direct beating or threshing. As a result of this, all the crushers get only groundnut kernels for their crushing operation. This means that during expelling, shells are not added to the nuts - which results in a low fibre content of the cake. Also, since the nuts are only expelled, the oil content of the cake is higher. Because of these two factors i.e. higher oil content and lower fibre content, Nigerian cakes are preferred. An average analysis of the Nigerian expeller cake is as follows:

Oil	:	5 %
Protein	:	50 - 51 %
Fibre	:	5 - 6 %
Sand & Silica	:	2.5 %
Castor Husk	:	Nil

The kernels purchased by the Marketing Board are in gunny bags and are stored in pyramid shape (each pyramid containing about 800 - 900 tonnes) in the open and covered by tarpulins. The selling price of groundnuts to the crushers is normally at the world price (London market price) less the expenses involved in shipping to U.K. However, margin is given for the sale of groundnuts at the end of the season when the FFA of the oil in kernel increases due to the long storage in open and especially sometimes when the storage is affected by rain. The Board takes precaution to fumigate the stock as and when necessary. It has been found that the FFA content increases from 0.5 percent for a fresh crop to about 3 percent at the end of the season. The kernels are of the soft variety with a low fibre content and are very easily crushed.

The crushing technique in Nigeria is very similar to the one followed in India by most of the mills with some variations in the disposal of the foots from the expeller. Usually, the crushing is done in two stages, with the oil content dropping from 48 percent to 17 - 20 percent in the first stage and 5 to 7 percent in the second stage. The kernels, as and when received, are usually passed through a sieve to remove any sand and silica and then sent to cookers. The cookers are the 4 stage stack type. The kernels are not subjected to any size reduction or flaking but heated straight to about 220 - 250°F and not much care is taken to adjust moisture content. Some

live steam is given depending on the quality of the outcoming cake. The moisture content may be about 5 to 6 percent. The cake from the **first** crushing is sent to a second cooker and again pressed to get the second stage or final cake with 5 to 7 percent oil content. The final moisture content of the cake is only 2 - 3 percent. Usually the oil from first crushing is separately stored since it is of better quality. The foots from the expellers, as well as the residue from oil filtration, are usually mixed with some shell (this is the only place where shells are used and that too only 2 percent is used) and passed through small cookers with low retention time (these cookers are similar to the ones we have in Indian plants) and passed through another set of short length screw expellers, where some more oil is extracted. This cake containing a higher percentage of oil than the second pressed cake is also mixed up with the main lot.

Mostly the first crushing is done in Rose Down's expellers and second crushing in Mark Type. The foots crushing is done in some plants with Indian made expellers. In one of the mills visited (Nigerian Oil Mills), there are some single stage expellers too, which bring down the oil content from 48 percent to 5 percent and the quality of the cake from these are in no way inferior from the external appearance. However, no detailed study has been done on the denaturing of protein when the cake is subjected to higher pressure and temperature in the single stage crushing than in two stages.

The power consumption by the crushing units is as follows:

First Stage Crushing: Rose Down's) 25 Tonnes/ HP: 50+15 Cooker
expeller each) 24 hours.

Second Stage " : Mark Type 6 Tonnes/ HP: 45+15 Cooker.
24 hours.

The product from the second stage expelling is not allowed to cool but is bagged hot (some cooling takes place in the conveyors) and stored. The normal thickness of the expeller cake is 5/16" to 3/8".

The screw worms are of special steel and have a good life. Maintenance or repairs are done in the mill itself where quality welding is done. The expeller mills are opened only once in 3 months for the usual cleaning of foots, etc. Foots are obtained more in single stage crushing than in two stage crushing. As regards quality, not many complaints have been received so far from the importers. The aflatoxin content of the cakes is fairly lower than the limits.

The average crushing cost (per ton of seed) works out to about Nigerian £5. This includes both direct and indirect expenses. This has remained about constant for the past few years. Though labour productivity is low, cost of labour is relatively low.

The Federal Government has given a rebate or concession on the export duty levied on the export of oils, cakes or seeds. A flat rate of 10 percent on f.o.b. is the duty imposed, and out of this a concession is given for oil and cake. This works out to 11 shs. 4d. on a ton of cake and 8 shs. 6d. on a ton of oil i.e. on an average, a rebate of 10 shs. per ton of seed crushed is given.

Most of the Nigerian groundnut crushing units are situated in the Northern part of the country and the products have to be exported through the ports of Lagos or Harcourt in the south which are about 700 miles away. This puts the crushers at a disadvantage. The country exports oilseeds as well as oilcake and oil to the U.K. The Marketing Board supplies the seeds to local crushers at a price = U.K. price minus incidental expenses viz. handling, freight, etc. This means that Nigerian cake has to compete with the cakes produced in U.K., using Nigerian groundnuts. Efficiency levels being what they are, The Nigerian Mills are able to compete essentially due to forward transaction i.e. the use of wits. Also the machinery in most of the units have been already depreciated and no new machines are being installed. The last expansion was in 1964 when due to a sudden increase in demand of cakes, the crushing capacity was increased from 250,000 tonnes to 400,000 tonnes. Since the old units are already depreciated this part of cost of production is fairly low.

The average freight and incidental costs involved in Nigeria are as follows:

	<u>Nigerian currency</u>	
Railway Freight from Kano to Lagos	£ 7	per ton of cake
Port charges	0-6-8	"
Store Handling	0-15-0	"

	<u>Nigerian currency</u>
Miscellaneous	£ 0-1-9 per ton of cake
Duty on FOB	10 % less the allowance
Freight from Lagos to U.K.Port	115 U.K.Shillings/Ton.

Though the production of groundnuts is varying between 650,000 tonnes to 1,000,000 tonnes annually, actual crush is reported as being only about 300,000 tonnes nuts. There are only six big units for processing. The total crushing capacity of the six mills together is put at 400,000 tonnes annually. However, this capacity is not fully utilised due to many reasons. Transport facilities are not adequate for the movement of groundnuts, cake and oil from Kano to Lagos. Transport facilities are not likely to improve unless the Government plans to spend on getting more rolling stock, engines, rails, etc. in case of railways, allows more import of trucks and spends on building good roads. The country is not in a happy position financially due to the internal civil war. A very significant fact is that at present (July 1968) there still lies a stock of about 400,000 tonnes of groundnut in Kano from the last production was 735,000 tonnes. This is yet to be moved to the ports.

The crushers are handicaped in another way in that storage capacity is inadequate at the port of Lagos. They have facilities to store upto about 3,000 tonnes of oil and 2,000 tonnes of cake.

But due to the present crisis, the conference lines are not keeping up to schedule. This leads to accumulation of cakes in open yards at ports and in rainy season the cakes deteriorate. This naturally puts a break to the continuous production of cakes and oil.

The trade is done mainly through brokers either at London or their agents at Lagos. The brokerage amounts to about 1 percent. The shipment is usually in lots varying from 50 tonnes to 2,000 tonnes, the normal one being 100 tonnes.

The present trend in Northern Nigeria is to go in for more production of cereals rather than groundnuts since the farmers are afraid there may be a shortage of food grains due to the civil war. This may eventually reduce the total production of groundnuts.

Generally speaking, the crushers are finding it difficult to meet both ends and one cannot expect any remarkable increase in exports of groundnut cake from this country in the next few years.

23. SENEGAL

Senegal is an important producer of groundnuts. Production statistics are given below:

	<u>Groundnut in Shell</u>			
	Area '000 hectate	Production '000 tonnes	Yield (Kg/ hectare	Commercial usage '000 tonnes
1949/50 to 53/54 (Average)	676	565	836	442
1954/55 to 58/59 (Average)	803	933	913	618
1959/60 to 63/64 (Average)	1002	912	910	799
1964/65	1005	1019	966	870
1965/66	1114	1121	1007	1011
1966/67	1114	857	769	786

It can be seen that there has not been any appreciable increase in the area or in yield per acre for the past ten years. Groundnut is grown mostly as a single crop and is not raised as an irrigated crop. The farmers are gradually moving from one part of the country to other parts for cultivation of groundnuts. There is a gradual south-eastern movement in the land under cultivation. Though about 60,000 to 65,000 tonnes of fertiliser is being used in Senegal, the usage of it for groundnut crop is not appreciable.

(There is a government subsidy of 10 Francs (CFA)^{1/} per Kg. of fertiliser used by farmers.) Very recently, a fertiliser plant with a capacity of about 130,000 tonnes per year has been commissioned as a result of the findings of phosphate rock. There are two government organisations controlling groundnut procurement and distribution. They are the ONCAD^{2/} and OCAS^{3/}. ONCAD primarily collects the seeds in shell from farmers. This is usually done either by private individuals or through co-operative societies. The percentage of private individuals employed has been slowly decreasing; since 1967-68, procurement and distribution are being done only through co-operative societies. The farmers are assured of a guaranteed minimum price for the produce and are also assisted by ONCAD in the procurement of seeds, fertilisers, etc. The price paid to the producer in December 1966 for the 1966-67 crop year was as follows:

2275 francs (CFA) per kilo of pods at Dakar;

2200 francs (CFA) per kilo of pods at Kaolack;

and 2125 francs (CFA) per kilo of pods at Zigunchor.

However, this has been reduced to 1,700 to 1,800 francs this year for the 1967-68 crop.

CFA^{1/} : Central French African.

ONCAD^{2/} : L'office National de Co-operative & Assistance pour le Development.

OCAS^{3/} : L'office de Commercialisation Agriculture du Senegal.

Senegal has all along been enjoying a privileged price for her products in France, almost 20 percent above the world market price. However, starting with the 1967-68 season, this has been stopped, leading to the lowering of the price paid to the producer.

There are only five big crushing units in Senegal and no small units at all. Three of these units have composite expellers and solvent extraction plants while the other two have only expelling facilities. The total crushing capacity of these units is about 600,000 tonnes of groundnut (in shell) out of which the cake from about 400,000 tonnes of groundnuts in pods can be solvent extracted. The biggest unit in the country has a capacity of about 1,000 tonnes groundnut in shell per day. M/s. Lecieurs Africa Limited formerly had two units - one of 700 tonnes and another of about 250 tonnes per day - located at different places but have recently removed all the machinery from the smaller unit and installed them along with the bigger unit to reduce the cost and to work more economically. They have a big storage capacity of about 30,000 tonnes and store groundnuts in pods and feed them to the decorticators, as and when necessary. Particular care is taken in removing unwanted hulls, fibre, sand etc., and the kernels which go to the next process contain very little impurities. The kernels are stored for a maximum period of three hours only. As in Nigeria, shell is not added to the kernels in this country during oil expelling. The decorticators

are very efficient and remove all the shell. The kernels thus obtained are first disintegrated into pieces of $\frac{1}{8}$ " or less size and then sent to the common cooker. The sludge from the oil, fibre and foots (whenever obtained) are mixed proportionally with the disintegrated kernel before going to the cooker. The cooker is a very tall (about 15 feet height X 8 feet diameter - 8 stage cooker wherein the retention period is about one hour and the moisture content is 6 - 8 percent and temperature 220°F . The cooked kernel fed to the screw expellers shell oil even before expelling. The expellers are the screw type ones. There are 18 of them, each with capacity of about 45 tonnes per day. The horse power requirement for each expeller is only 60. The cake which comes out of the expeller is at a temperature less than 90°C and is very thin (about 3 mm.) It is quite white in colour and has an oil content of about 14.0 percent. This cake is continuously fed to the solvent extraction unit. The solvent extraction unit is a 400 tons per day Desmet unit and operates in a similar way as the Desmet units in India. The average solvent loss is about 3 cubic meter per day. The desolventised meal is then sent to the pelletizers where the foots from the raw oil centrifuges are added and made into pellets. This is the only plant in Senegal, having pelletizing facilities. The pellets after cooling are either stored in bags or sent by conveyors to the ships which are berthed alongside the factory for bulk shipment. The importers of oilcakes

in the Continent prefer pellets since this reduces the handling charges as well as wastage due to powder dusting.

An average analysis at different stages is given below:

Groundnut in pods

Kernels	: 74.1 %
Impurities	: 0.7 - 1.3 %

Kernels

Oil	: 43.8 %
Fibre	: 5.0 %
Acidity	: 0.5 %
Moisture	: 4.1 %
Impurities	: 3.5 %

Extracted Cake

Moisture	: 6.8 %
Oil	: 0.67 %
Ash	: 0.8 %

Pellets

Moisture	: 11.0 %
Oil	: 0.75 %
Fibre	: 8.5 %
Protein	: 52.6 %
Ash	: 3.7 %
Aflatoxin	: 0.052 %

Oil

FFA	:	0.62 %
Moisture	:	0.20 %

The cakes and pellets, being not subjected to higher pressure and temperature, are whiter in colour than the cakes found in India or Nigeria.

The cake is usually exported either in bags or in bulk. Usually, the method of exporting is directly between the exporters and the importers, without any brokers. The Chamber of Commerce at Dakar indicated that export duty is as follows:

For groundnut oil	:	0.50 % on f.o.b. value
groundnuts (kernel)	:	20 % "
groundnut cakes	:	9.4 % "

The cakes are usually exported in tramps and take about 15 days to reach Continental ports.

Among the importers, France takes a major portion of Senegal's extracted cake, while the Scandinavian countries prefer the expeller cakes. The expeller cakes fetch about 1 to 2 Francs per 100 kgs. higher than the extracted cakes which are quoted at about 49.50 FF per 100 kg. CIF (as on July 11, 1968) because of the higher oil content.

Though there is an optimistic feeling that the production of groundnut will touch a new figure of 1,400,000 tonnes in 1973

(with the same acreage), one cannot firmly say that this is possible. One reason for this is the lowering of price to the producer** and secondly the farmers prefer to grow more of cereals like rice or millet*. Again, since the protection offered by France has been cut off, the crushers as well as producers have to work on identical conditions as other competing countries like India, Nigeria, etc.

FF : French Franc.

** : It has been reported that the producers are not given the money for the produce this season, but are given assurance papers which may be cashed later on. However, the farmers being in need of money sell these at even 50 percent for immediate realisation.

* : Increasing the area under rice and millet and decreasing the area under groundnuts.

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